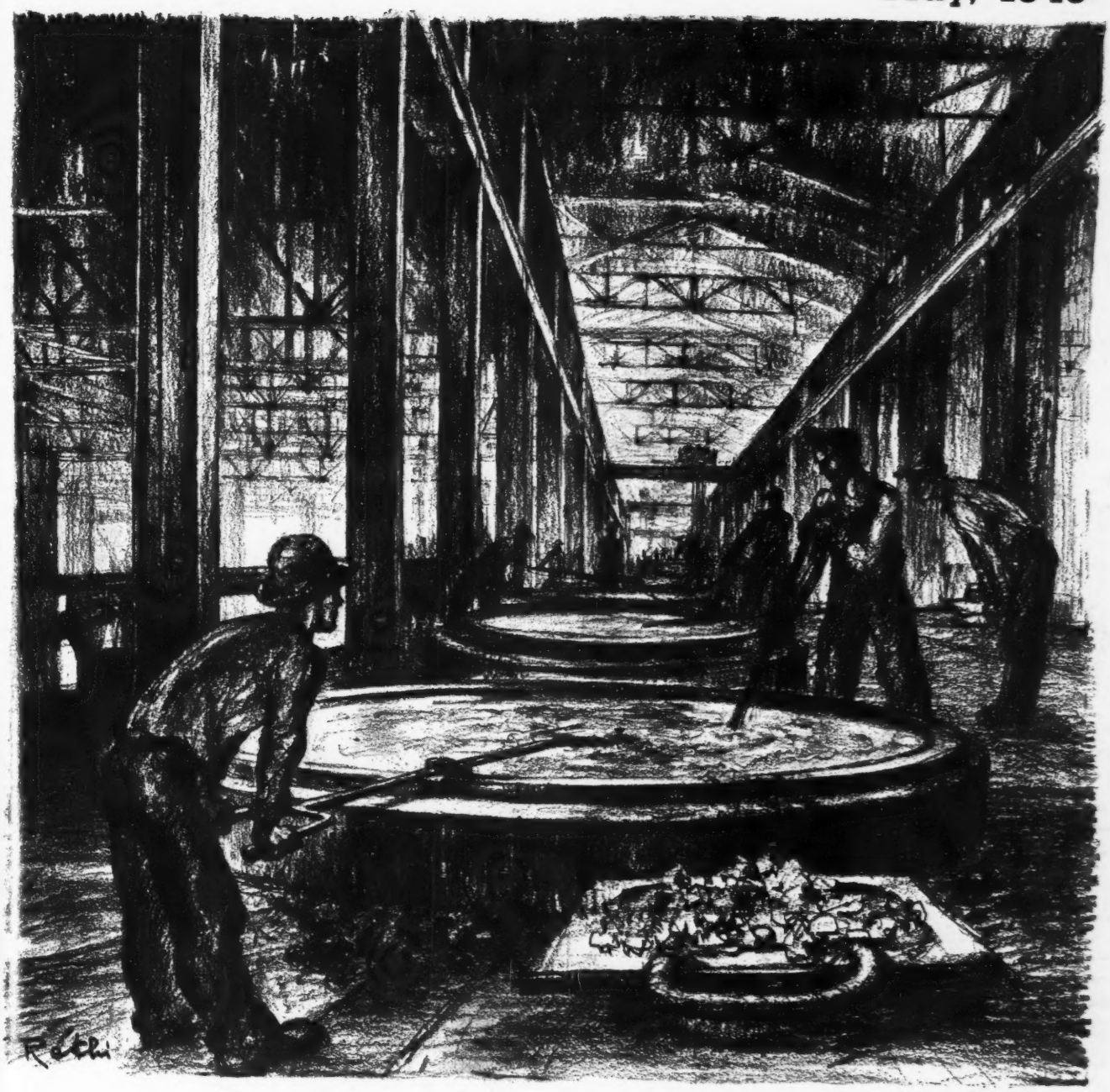
# ENGINEERING AND MINING JOURNAL

ence Library

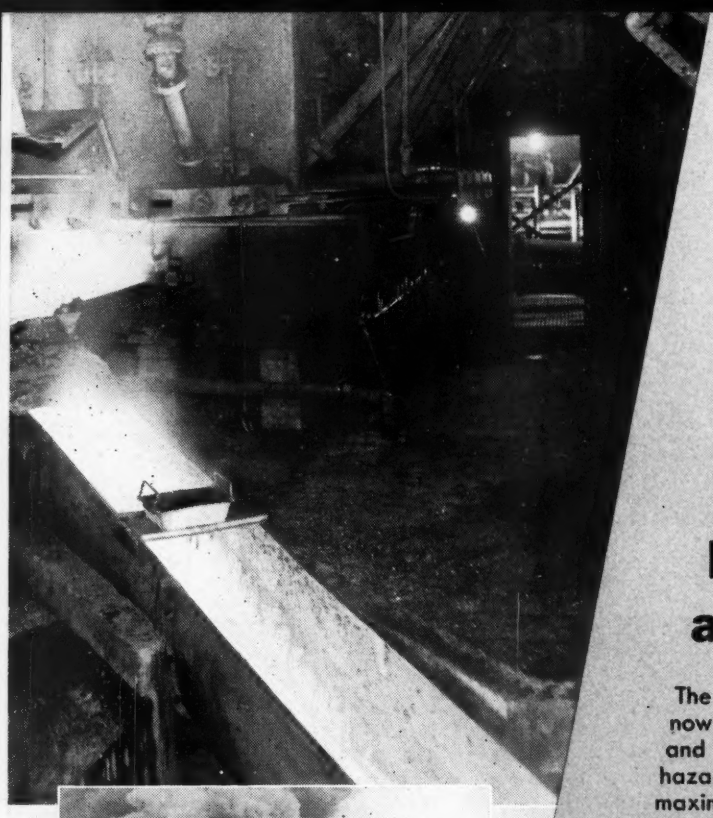
I 4 1945

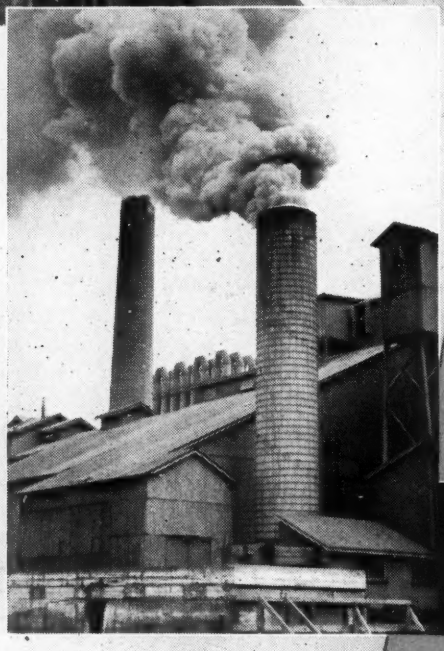
May, 1945

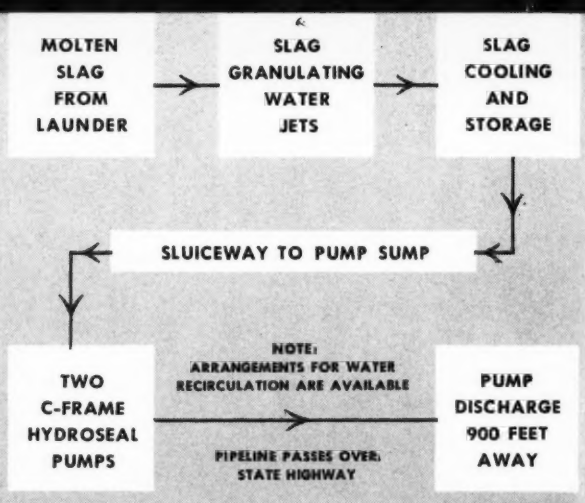


On the kettle floor in a Western lead refinery.

## Management Also Has Rights PAGE 74



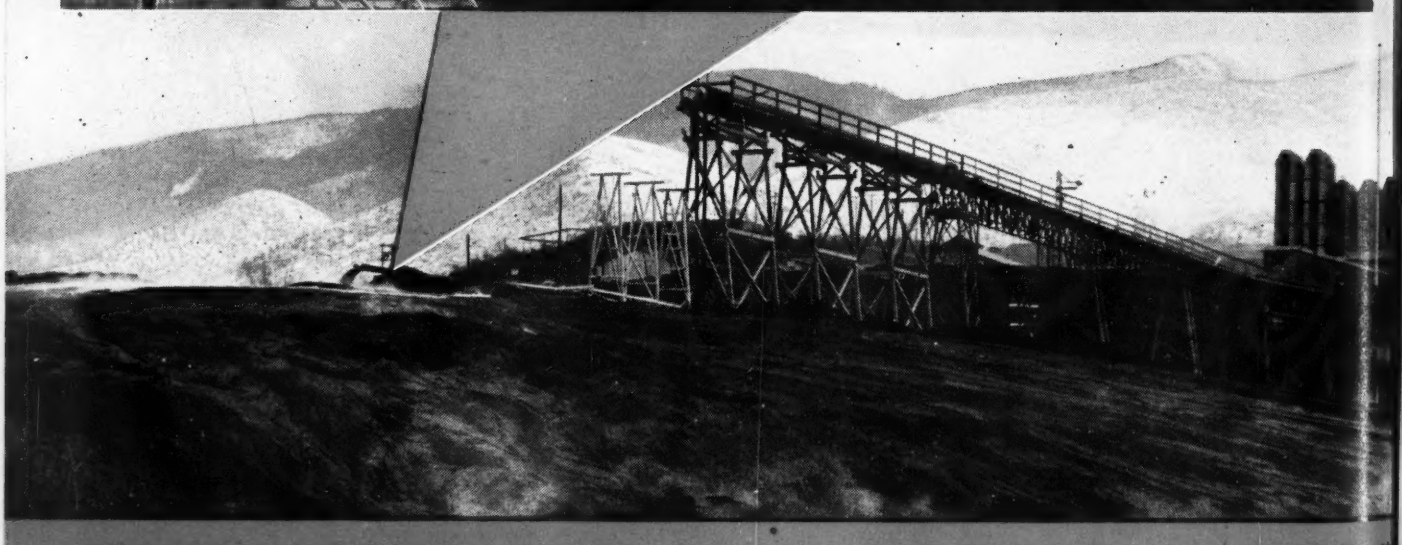



MOLTEN SLAG FROM LAUNDER
SLAG GRANULATING WATER JETS
SLAG COOLING AND STORAGE
SLUICEWAY TO PUMP SUMP
TWO C-FRAME HYDROSEAL PUMPS
NOTE: ARRANGEMENTS FOR WATER RECIRCULATION ARE AVAILABLE
PIPELINE PASSES OVER STATE HIGHWAY
PUMP DISCHARGE 900 FEET AWAY

# Molten Slag Granulated and Pumped to Waste Land

The Zinc Fuming Plant of Bunker Hill Smelter at Kellogg, Idaho, now handles about 400 tons of slag daily, without the operating and maintenance cost of locomotive drawn, slag car trains. The hazards of transporting fluid slag in open cars are eliminated and maximum cleanliness is secured, for slag never sees the light of day from the launder to the point of final disposal. . . . High pressure water jets of the Hydrojet Slag Granulating System transform the molten slag into fine particles, which are stored under water, cooled, removed and sluiced to a sump by water and then pumped away by two C-Frame Hydroseal Pumps. (They have 8 more Hydroseals on other jobs.) Only one man per shift is needed to operate this totally enclosed system, which handles about 30 tons, 13 times daily. Photo in upper left shows slag flowing thru the launder to the granulating jets, picture at left shows steam arising from vent stack during granulating period, while photo below shows pump discharge and slag filled waste land. . . . If you have a tough materials handling or pumping problem, see our engineers about Hydrojet Methods and Hydroseal Pumps. Catalogs on request.

## HYDROJET SLAG GRANULATING SYSTEM WITH HYDROSEAL PUMPS



HYDROSEAL, PACKLESS AND MAXIMIX DESIGNS ARE COVERED BY PATENTS AND APPLICATIONS IN THE MAJOR MINING CENTERS OF THE WORLD AND CAN BE PURCHASED ONLY THROUGH THESE COMPANIES

**THE ALLEN-SHERMAN-HOFF CO., 229 S. 15th St., Philadelphia, Pa.** *Offices or Representatives in most Principal Cities*

CANADA: CANADA PUMPS LIMITED, Kitchener, Ontario AUSTRALIA: HOBART DUFF PTY., LTD., 360 Collins Street, Melbourne

SOUTH AFRICA: THE DENVER MACHINERY CO., LTD., 206 Commissioner St., Johannesburg

# ENGINEERING AND MINING JOURNAL

ALFRED M. STAEHLE, Publisher — EVAN JUST, Editor

H. C. PARMELEE, Editor Emeritus; A. H. HUBBELL, Managing Editor; ROBERT H. RAMSEY, Associate Editor; H. H. WANDERS, Market Editor; ALVIN W. KNOERR, W.N. P. REED, Assistant Editors. San Francisco: J.B. HUTTL, Associate Editor; G. J. YOUNG, Consultant. Washington, D. C.: PAUL WOOTON

Volume 146 — **MAY, 1945** — Number 5



**Editorials** ..... 71

**Management's Rights Under Collective Bargaining** ..... Dr. George W. Taylor 74

**Philippine Mining Is Expected to Resume** ..... James S. Baker 77

**Unexpected Use Transforms Outlook for Quicksilver** ..... H. H. Wanders 80

**Centralized Washing for Hard-Rock Phosphate** ..... T. D. Felton 81

**War and Gold** ..... Charles White Merrill 86

**Insulated Ladle Cuts Magnesium Refining Costs** ..... H. G. Satterthwaite 90

**What Mining Men Are Doing About the Manpower Shortage** ..... 92

**Lead-Zinc Flotation Problem Solved in Grinding Circuit** ..... John B. Huttl 94

**Rock-Drill Repairs Can Be Reduced** ..... 96

**Operating Ideas** ..... 99

Hinged Hook Clears Jammed Gyratory Crusher ★ Simple Alteration Permits Continuous Filter Operation ★ Metal Lash Plank Aids Timber Installations ★ Safety Car-stop Installed in Cage Deck ★ Alarm-Clock Switch Controls Laboratory Tests ★ Straw Sack Speeds Bin Repair

**Market Summary** ..... 102

**Washington Reflections** ..... 104

**News of the Industry** ..... 106

**Book Reviews—Publications Received** ..... 110

**Personal Items** ..... 112

**Obituaries** ..... 114

**Letters** ..... 116

**Equipment News** ..... 118

**Regional News** ..... 120



Copyright 1945, McGraw-Hill Publishing Co., Inc.



**McGRAW-HILL PUBLISHING COMPANY, INC.**

James H. McGraw, Founder and Honorary Chairman

James H. McGraw, Jr., President and Chairman of the Board
Curtis W. McGraw, Vice-President and Treasurer
Howard Ehrlich, Executive Vice-President for Business Operations
Joseph A. Gerardi, Secretary
John Abbink, Executive Vice-President for Editorial Operations
J. E. Blackburn, Jr., Director of Circulation

Publication Office: 210 S. Desplaines St., Chicago 6, Ill. Editorial and Executive Offices: 330 West 42nd Street, New York 18, N. Y. Cable Address: McGraw-Hill, New York. Branch Offices: San Francisco 4, 68 Post St.; Chicago, 520 N. Michigan Ave.; Los Angeles 14, Calif., Pacific Finance Building, 621 So. Hope St.; Washington, D. C., National Press Building; Pittsburgh, Pa., 738-9 Oliver Building. District Managers: New York, T. E. Alcorn, F. W. Roets; Philadelphia, J. F. Cleary, W. A. Potter; Cleveland, W. M. Spears; Pittsburgh, W. S. Drake; Chicago, S. J. Alling; St. Louis, C. J. Coash; San Francisco, J. W. Otterson.

**McGRAW-HILL PUBLISHING COMPANY, LTD.**

Aldwych House; Aldwych, London, W. C. 2, England
Cable Address: Backlash, Estrand, London


**CHANGE OF ADDRESS**

DIRECTOR OF CIRCULATION,
Engineering and Mining Journal,
330 West 42d Street, New York 18, N. Y.

Please change the address of my Engineering and Mining Journal subscription.

Name .....

Old Address .....

New Address .....

New Company Connection .....

New Title or Position .....

# COST SAVING PERFORMANCE

WILFLEY pumps bring to your plant an outstanding dependability...a true high efficiency...that means a material reduction in production costs. This characteristic of the WILFLEY comes from exclusive engineering principles and improvements backed by many years of pioneering and experience in the field. Heavy pumping parts of alloy iron, alloy steel, rubber when available—whatever material works best on your job. Individual engineering on every application. For low cost and full-time performance, buy WILFLEY. Write for details.

**WILFLEY**

**A. R. WILFLEY & SONS, Inc., Denver, Colo., U.S.A.**

New York Office: 1775 BROADWAY...NEW YORK CITY

# SUSTAINED CONSTRUCTION ACTIVITY

## *One Step Toward High Level Employment*

IN the 34th editorial of this series, it was pointed out that sustained prosperity, based on high level employment, was a major postwar goal accepted by government, management and labor.

That editorial developed the theme that, if the goal were to be approached without undue sacrifice of our essential liberties, we must forego the search for magic panaceas, and follow the harder but more promising course of analyzing step by step, and industry by industry, the measures that might contribute toward the end sought.

This is the first of a number of editorials following such a particularized approach. It will examine the role of the construction industry in forwarding sustained prosperity.

☆ ☆ ☆

The influence of construction upon the general level of economic activity is important but not decisive. The claim is frequently advanced that major fluctuations of the business cycle might be ironed out by a properly devised and timed public works program; but any examination of the relatively modest contribution of construction activities to total national output will demonstrate its extravagance.

In the twenty years from 1920 through 1939, the value of new construction averaged just over 8½% of the gross national product. If we add repair and maintenance expenditures, the total is increased to a little over 12% of the gross product. But approximately two thirds of the construction of this period was privately initiated, and only one third was represented by government construction, federal, state and local combined. To expect that we can level out the peaks and valleys of our whole economy through manipulating the 4% portion that is represented by government construction is to expect a very small tail to wag a very large dog.

In fact, the record of construction activity in the past has been on the side of disequilibrium rather than stabilization. In boom times construction activity has climbed to relatively higher peaks than those reached by the economy as a whole; in depression periods it has fallen to deeper troughs. Aside from the special work relief program of the depression thirties, the performance of public construction in this respect is little better than that of private. New government construction mounted with the general trend of the boom from 1921 to 1929, thereby adding its weight to the inflationary trend.

Instead, then, of expecting the construction industry to stabilize our whole economy—a task clearly beyond its power—it would seem appropriate to ask that it look to the more attainable goal of leveling out its own violent fluctuations. If this can be done, many of the most vexing problems of the construction field and of its sphere of influence will be mitigated, employment will be regularized in one important segment of industry where the past record has been particularly uneven, and one aggravating contribution to general business instability will be removed.

The achievement of these highly important, if limited, aims will require the thoughtful, vigorous, and concerted cooperation of management and labor in the construction industry, of a variety of governmental agencies, and of those who direct the sources of construction credit. Of the many measures that must be woven into an ordered program, it is practicable here to present only the broad outline of those which seem to offer the greatest potential usefulness.

☆ ☆ ☆

1. Stabilization implies the holding of a balance rather than a freezing at a given level. No rigid formula for a most desirable level of construction activity is possible or desirable. However, it may be accepted as a reasonable initial premise, that we could sustain in the future without major distortion something like the 12% ratio of total construction to gross national product that has been approximated in the past. If it is to serve as an useful reference point, such a generalized premise must be subjected to constant testing both nationally and locally. There must be careful and continuous scrutiny for signs of demand saturation, cost inflation, and labor shortages, all danger signals of far greater reliability than any percentage formula.

The first requisite then is the general availability of information along such lines, far more complete and current than has hitherto been at hand. The second is a general will to hold building activity at a level as high as but not higher than we probably can sustain. Once this principle is accepted, the problem becomes one of marshalling all available instrumentalities to forward it.

2. Public construction, although too small to exert a decisive influence upon economic activity as a whole, can

condition construction trends to a major degree. If, in the decade following the war, government construction approximates its 1920 to 1940 average of one third of all construction, its properly timed impact could do much to level out the construction cycle.

To do this most effectively, public construction should be deferred where and when private building is going forward at a satisfactory pace, and should be started when and where private activity shows undue slack. All government construction does not lend itself to such adjustment. But a large portion of it could be held up for the three to five years which, upon past experience, would provide the necessary leeway to counteract the more violent fluctuations in private building.

Such a program presents numerous difficulties both political and administrative. None should be insurmountable, and the results promise to be of sufficient moment to justify the extraordinary effort that would be required to coordinate federal, state and local government programs. Here is an excellent forum for testing whether or not government economic activity can be made to supplement rather than supplant private effort to serve ends upon which all are agreed.

3. Since private building, postwar as in the past, must supply the preponderant share of construction activity and employment, costs will continue to play a dominant role in determining levels of operation. Wartime restrictions have created formidable backlogs of deferred demand for most types of private, and for many of public, construction. Such demand is so great that it almost certainly will provide the impetus for a postwar building boom of several years duration. There is considerable doubt that in the beginning our building trades, dislocated by war and at low ebb, can organize rapidly enough to carry their share of the anticipated general advance.

However, if former patterns hold, building activity, after a lagging start, will soar, costs will mount, and eventually will saturate effective demand with resultant collapse. That, of course, is precisely the sort of a situation we are seeking to avoid. Crucial to this end is the prevention of rising costs or, better still, the reduction of building costs from present swollen levels.

A recent study by technicians of the War Production Board on the outlook for private housing construction illustrates the point. From 1900 to 1940 the number of housing units built in this country closely matched the statistics of new family formation. The former ran considerably ahead of the latter from 1920 to 1929, and fell behind by the same margin in the following decade.

If the market for new houses were to be similarly limited for the period from 1940 through 1949, the effective demand for new housing during the last five years (1945-1949) is estimated at 3,000,000 units. That is after allowing for houses built from 1940 through 1944, and for vacancies, demolitions, and other factors. If, however, prices could be reduced to 1939 levels, the 3,000,000 unit demand is estimated as increasing to more than 7,000,000 units. Since the latter figure is substantially beyond our production capacity for the period, a backlog would be created that would support an effective sustained demand for the subsequent decade (1950-1959) of 1,000,000 units per year, as against half that amount if rents and sales prices mount with increasing incomes.

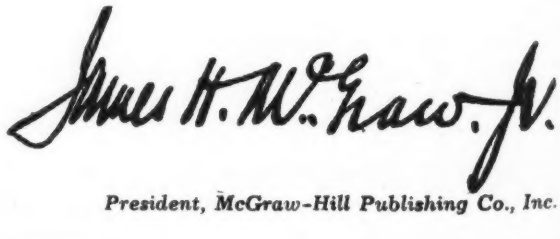
The precise accuracy of such an estimate may well be questioned. There can be no question as to the general validity of the point illustrated. The progressive lowering of construction costs will stimulate demand in this field as it has in others. Building management, labor, and their suppliers and customers stand to gain from such a result. Unnecessary restrictions against the adoption of improved technologies and increased productivity should, therefore, be removed, whether imposed by codes of government, regulations of unions, collusion of managements, or inertia of workers. Unless there are compelling social justifications such restrictions must be judged harmful to the whole economy.

4. Numerous other measures could contribute substantially to increased and increasingly stable construction activities. Space remains only to stress the importance of careful consideration for the use of credit facilities as a means of stabilization. In recent years the establishment of the Federal Housing Administration provided a needed stimulus to mortgage lending in the field of housing. The modern pattern of long-term mortgages, providing for regular amortization as well as interest, should be a steadying factor in periods of liquidation. However, there appear to be further possibilities for using credit facilities as a brake when construction activity threatens to climb beyond a level that can be sustained. If public and private lending agencies could devise sound means for raising mortgage rates, increasing down-payment requirements, shortening amortization periods and basing value appraisals upon normal rather than inflated costs, they might exert a healthy influence against the tendency of the construction bubble to inflate until it bursts.

☆ ☆ ☆

**There is no royal road to sustained high level employment. There is not even a single path to assured construction stability—there are many paths, all strait and narrow and all paved with bruising cobbles. This is true for all other major segments of industry.**

It is easier to seize upon a magic formula such as monetary control, or deficit spending, or any one of a score of others, than to undertake an intricate task of piecemeal exploration. But only the latter course will lead to prosperity.



*President, McGraw-Hill Publishing Co., Inc.*

THIS IS THE 35TH OF A SERIES

# ENGINEERING AND MINING JOURNAL

May, 1945

## The New Skipper

PRESIDENT TRUMAN takes office with awe over the enormity of his task that is shared sympathetically by hopeful people the world over. The sincerity of his request for Congressional cooperation and his energetic tackling of stupendous problems have been heartening.

The world-wide dismay over the death of President Roosevelt was evidence of his profound influence in shaping a basis for international cooperation. The late President's irresistible charm may have been necessary to hold the United Nations together at the outset. However, the quick resurgence of optimism on the domestic front betokens realization that sooner or later the American people will have to go it on their own, with strength in many rather than in one.

In our opinion the new President will simply shift the course of the Executive Branch slightly to the right. We believe the broad lines of his course will be determined by: (1) a normal desire to achieve a worthy record in such an exalted position; (2) his Congressional background; (3) his ordinary qualifications; and (4) a natural desire to be re-elected.

Thus we anticipate that the "palace guard" will gradually disappear. Solid conservatives in the Democratic Party, like Byrnes and Senator George, will gain in influence.

We believe that the President will seek to live down some of his past associations, and that the slimy political machines will find him no catspaw. However, he will seek to retain their loyalty plus that of labor and a reasonable share of farmers because these represent the votes needed to win re-election. Therefore, do not undertake to hang by the thumbs until the Wagner Act is repealed, because that just won't happen. Nevertheless, the principal abuses under our labor tribunals—those due to the host of starry-eyed zealots who pervade the agencies of government—are likely to be corrected gradually.

We predict a drift toward having more capable people in the cabinet. Probably the cabinet will be less of a puppet show and will have to bear more of the responsibility of government. Several cabinet changes are expected. Plausible reasons for changes affecting every cabinet post have been advanced by various "authorities." However, if Ickes goes, it may be too much to expect that the "termites" who operate close to him will be scattered.

The Executive will definitely encourage Congress to regain its Constitutional functions. We believe he will also use any opportunity to strengthen the Supreme Court by appointments that will restore its prestige as a judicial body and influence it away from its present tendency to legislate. The drift toward government doing everything for everybody will be checked—we dare not hope that it will be reversed. There will be a stronger effort to balance the postwar budget—but, inasmuch as expenditures will probably be between 25 and 35 billion per year, it is too much to hope that either Congress or the Administration will accept the onus of raising the taxes necessary to do this.

On the international front, as elsewhere, we do not look for sweeping changes. Truman has already backed up the Reciprocal Trade program. However, in negotiating trade pacts, as well as on the diplomatic front in general, there will probably be a greater disposition to scrutinize our end of a bargain and to doubt that Uncle Sam can be Santa Claus to the whole world.

## Confusion Over Labor Policy

THE CONFUSION resulting from our current attempt to govern by opinion rather than by law is well exemplified by the recent flip-flop of the National Labor Relations Board in giving the green light to the Foremen's Association of America in its drive to organize the foremen of the automobile industry.

Why do we say "confusion"? Because on page 76 of this issue, Mr. George W. Taylor, chairman of the War Labor Board, says, "Foremen and shift bosses must be depended upon as important representatives of management." Farther along in the article he says, "The importance to employers of the type of man that represents them as foremen and shift bosses cannot be overemphasized." Quite obviously, Mr. Taylor believes,

as we do, that foremen and shift bosses are a part of management.

But because a couple of men in a separate labor agency make a jittery interpretation of the Wagner Act based on current emotions rather than on logic, Mr. Taylor will soon find himself forced to recognize foremen as part of the labor force, whether he wants to or not. Thus our government's labor policy, which ought to be a thing of equity, clarity, and stability, fluctuates from day to day with the shifting opinions and prejudices of the men who administer it.

## Gold Is a Puzzle

MR. MERRILL'S ARTICLE in this issue arouses some doubt over the outlook for domestic gold producers, at least in comparison to 1934-41 economies.

To restore the palmy conditions of the late thirties will require lowering of present wages and supply costs or a boost in the gold-dollar ratio. At present it is impossible to predict the future course of any of these factors. However, it seems safe to assume that government will make strong efforts, if necessary, to keep prices and wages inflated, to prevent our colossal debt from strangling the economy. In other words, a return to the economic balance of the late thirties for gold producers will probably require a rise in the gold-dollar ratio.

At present there is little evidence of any official intention to raise the price of gold. An attempt to do so recently (see *E. & M. J.*, April, p. 121) was not only decisively defeated in a Senate committee but was roundly condemned by Administration officials. Moreover, Senator Wagner and Chairman Eccles, of the Federal Reserve Board, disparaged the entire idea of having any security behind domestic currencies beyond the credit of the government (*E. & M. J.*, April, p. 84).

Addressing the Academy of Political Science on April 14, Dr. E. A. Goldenweiser, economic advisor to the Federal Reserve Board, characterized the gold standard as a creditors' standard and unsuitable for modern conditions. Paraphrasing the words of William Jennings Bryan, but with another implication, that "the American people are not willing to be crucified on a cross of gold." He goes on to state, further, that

"The proposed Monetary Fund should be viewed not as primarily a lending institution but precisely as a new monetary standard. . . . It comes nearer to representing a truly international standard than any standard that has previously been in existence. Perhaps 'multilateral standard' or more simply 'mutual standard' might be adopted as the name for the new monetary standard."

People who are booming gold shares and mining organizations which are seeking to acquire new gold properties obviously are not in accord with the high British and American financial officials who dislike the gold standard. What do these investors see in the outlook that stimulates their optimism concerning gold?

The government price of gold is merely a reflection of public desire to have gold. In considering recent history it is usually forgotten that the official price boost in 1934 simply confirmed a rise in the world price that had already taken place. Today there is certainly no lack of public confidence in gold anywhere. In fact, we are sure that the entire world's stock of monetary gold would disappear into private hoards at $35 per ounce or higher if governments would only make the metal available for private purchase. As long as this public lack of confidence in fiat currency prevails, gold is not likely to go begging or to be divorced completely from monetary programs and trade settlements.

In a nutshell, we wish we had a gold mine, especially if there were good fishing near by.

## Lessons From Captured Materiel

METALLURGICAL EXAMINATION of captured enemy matériel is revealing information of great value to our Army, Navy, and Foreign Economic Administration. For example, discovery of an enemy shift from one raw material to another, or from one method of production to another, may disclose a shortage of material or equipment, and thus uncover bottlenecks whose further contraction by military or economic action can do irreparable damage. Detailed evidence is contained in a report to the War Metallurgy Committee of the National Research Council by metallurgists of Battelle Memorial Institute, published in the February number of *Metal Progress*.

Striking differences are revealed in examination of matériel captured from Japan and Germany. Broadly speaking, Japan apparently has had an abundance of vital alloying metals, whereas Germany has felt the pinch of shortages in such metals as copper, nickel, molybdenum, vanadium, chromium, and manganese, in about that order. As a direct consequence, the Germans

have been obliged to exercise more scientific ingenuity and control than the Japanese in shifting to substitutes—from brass to steel for large cartridge cases, from copper to iron in the driving bands of projectiles, and in the use of less nickel and more chromium and molybdenum in armor.

By contrast, the Japanese have stuck to conventional alloys of copper and aluminum as well as of steel, copying early American and other specifications. Furthermore, unlike the Germans, they have taken no pains to segregate scrap steel so that the alloying elements can be used to best advantage. It is also revealed, judging from the presence of residuals, that the scrap which the United States sold to Japan before the war plays a considerable part in the munitions being used against us. Finally, in design, workmanship, and standards of production, Japanese matériel is reported to be mediocre and inferior to that of Germany.

In general, the study of enemy matériel has revealed few innovations in metallurgy applicable to American practice. The greatest value of the study lies in its military implications.

## Land Withdrawals Should Be Scrutinized

THE ARMY'S Saline Valley bombing range, Inyo County, Calif., includes the Ubehebe mining district, a past producer of copper, gold, lead, and silver. Also the Naval ordnance test station in Inyo, Kern, and San Bernardino counties, now being used principally for rocket testing, proposes the permanent withdrawal of a 232,000-acre north extension of the present 388,000-acre reservation. The extension includes the Coso mining district, a producer of copper, gold, lead, silver, and tungsten. It lies only two miles from the Darwin district, a lead-silver-zinc area.

The mining industry certainly does not want to interfere with the use of marginal mineralized areas by the fighting services during the war; however, where a withdrawal is intended to be permanent, we believe that possible future need for the minerals involved should have most careful consideration. We know that the preservation of maximum self-sufficiency in minerals is as vital to security as military facilities. We know that the fulfillment of our mineral needs will require a thorough combing of all known mineralized areas plus a scientific search for concealed mineralization. Therefore, we suggest that the Congressional committees on mines and mining should carefully scrutinize all proposed permanent land withdrawals to find out if government needs cannot be met in non-mineral areas, and also to discover what undisclosed objectives may be behind Mr. Ickes' moves to make huge areas unavailable for mineral entry.

## MILLING AROUND

Our armies in Europe are finding that the Germans were not seriously pinched for copper. They obtained the metal primarily from wrecking structures and buildings in occupied countries, not from mines.

*Robert C. Stanley, chairman and president of International Nickel Company of Canada, informed stockholders at the company's annual meeting that Russia's agreement to make compensation payments for the Petsamo mine, which she took over in Northern Finland, should not be criticized. Nevertheless, he thought that in the long run International Nickel would be better off with the Petsamo mine than with the* $20,000,000 *that is to be paid for the property.*

A simple episode in Mexico epitomizes the case for hard money. The president of A.S.&R., Roger W. Straus, was walking through a small village near one of his company's Mexican mines. Seeing an old woman selling bananas, he offered a half-peso note; she gave him a couple of bananas. He withdrew the paper money, then offered a silver half-peso coin, whereupon she quickly turned over her entire basket of bananas.

*According to O. H. Lindblum, of San Francisco, whose father discovered gold near Nome, Alaska, the name "Nome" was simply his father's misunderstanding of an Indian chief who was trying to say "no name."*

Testifying before the Senate investigation into light metals, Brig. Gen. Hopkins revealed a new method of reclaiming scrap aluminum. The metal is digested in caustic soda just as is done with bauxite, to produce alumina.

*Chairman Ryder of the Committee for Reciprocity Information announced the State Department intention to write quota clauses into future trade treaties. We would take this more seriously if past experience indicated willingness of the State Department to utilize existing "escape clauses" under appropriate conditions.*

Under Collective Bargaining, Management Has the Same Right Security. . . . It is Management's Duty to Make Such Demands on to Perform His Functions

# Management's

## Under Collective Bargaining

MAKING COLLECTIVE BARGAINING WORK in the interests of both management and labor is one of the greatest problems facing American industry today. In fact, if management, labor, and capital fully realized what will probably happen to our free enterprise system if collective bargaining does not work, they would unite in a supreme effort to compose their differences in a democratic manner free of government regulation.

What is needed, and needed greatly, is a new science of industrial relations to be developed jointly by management and labor, a science in which government will play the smallest possible part. Only under such a program of genuine collective bargaining can the rights of both employer and employee be fully safeguarded.

Yet I believe that the establishment of collective bargaining must have been a rude shock to management in the metal-mining industry, perhaps more so than to men directing almost any other form of activity. Naturally, to men as self-reliant as the members of the mining fraternity, the thought of being forced into a bargain is distasteful; and when this compulsion reaches a point where the mine manager's old-time complete freedom of control over his operation is impaired, the words "collective bargaining" take on for him a kind of nightmare quality.

His natural reaction was well expressed by one mine manager who was asked how things were going. "Why, fine!" he said. "I sit up here in the office and the dash blank union tells me what to do." Natural as that reaction may be, it is time for that manager, and others like him, to realize that such an attitude can only make matters worse. I suggest that it would be far better to study ways and means of using collective bargaining to the mutual advantage of management and employees. There are such ways, as I hope to point out.

### Bargaining Not a War

From the management view, collective bargaining does not mean a series of grudging concessions secured from management by pressure of various kinds. Allowing labor relations to become a sort of defense in depth, in which management fights desperate rearguard actions, is to undermine collective bargaining as a dynamic positive industrial force.

Union attitudes and union policies may encourage such an approach under some conditions. Indeed, the shortcomings of some unions may induce a feeling of hopelessness regarding the future of collective bargaining as a social institution. It must be remembered, however, that new institutions are established only with difficulty, and we cannot even start in the right direction on this one if management makes a negative approach to the task.

On the union side, I do not think collective bargaining consists of wringing concessions from management by force or by threat of force, irrespective of economic considerations or the needs of proper plant management. Unions that once fought bitterly for existence may be reluctant to give up the concept of labor relations as an undeclared war, but give it up they must if collective bargaining is ever to lay claim to institutional status.

To define it in positive terms, collective bargaining is a way of industrial life. It represents a fundamental change in approach that was brought about by the Wagner Act, when collective bargaining was adopted as the institution by means of which wages, hours, and working conditions should be determined. The rights of employees were properly recognized, but the task of making collective bargaining work as a constructive force still lies largely ahead. The apparent clash of interests between employer and employee must be smoothed out by both parties in concert, and at the same time management functions essential to efficient business operation can be preserved.

As an example of what collective bargaining will have to do, consider the setting of wages. I do not think we can continue to set them in America as we have in the past. Back in 1937, when union drives were on, many plants gave what-

to Provide for Management Security as the Union Has for Union the Union as Are Necessary to Preserve the Employer's Ability

# Rights

**DR. GEORGE W. TAYLOR**
Chairman, National War Labor Board, Washington, D. C.

*International News Photo*

**Dr. Taylor is well qualified to discuss collective bargaining because of his experience as an arbitrator in the hosiery, clothing, and automobile industries, where he was engaged by both parties to union contracts to act as impartial umpire. He is generally believed to be the author of the Little Steel formula around which the government's wartime wage stabilization program has been built.**

**Both management and labor were startled when Dr. Taylor first advanced the ideas on which this article is based at a conference of the American Management Association in New York. Because of the soundness of his views and his competence to discuss them, *E.&M.J.* invited Dr. Taylor to re-state, for the mining industry, his idea of collective bargaining as a joint bill of rights for employer and employee.**

ever wage increases were deemed necessary to keep unions out of the plant. Once unions became established, their leaders sought additional wage increases to help maintain membership gains. I do not think that wages, under our economic system, can satisfactorily be fixed on the basis of such considerations.

Vital cost-price relationships must hereafter be dealt with in collective bargaining; a wage policy must be developed that will meet both competitive necessities and the living necessities of the workmen. Both parties will have to participate in solving this problem, and I think that on the successful performance of that dual function will depend the permanence of collective bargaining.

## Here to Stay

That brings up the question of whether or not collective bargaining is here to stay. On the basis of three years of service with the War Labor Board, I can say that I think it is. I believe that it is vain for any company to hope that when the war is over, or when a new administration takes office, the unions can be kicked out and the "good old days" restored. If anyone believes that workers generally will ever return to a state where they have no voice in the determination of the working conditions that vitally concern them, he is greatly mistaken. The urge of employees for free association is inherent and powerful, and it has been gratified too long ever to be given up without the bitterest of struggles.

In any event, managers of mines, along with all industrial management, have a tremendous stake in making collective bargaining work, for that process offers them a protection against forces that have trampled upon employers' rights in other countries. Indeed, of all the major drives that are now being made by people throughout the world for a better life, the drive for collective bargaining is the only one I know of that accepts the desirability of a capitalistic economy, that accepts private ownership, the wage system, and the profit motive as the best means of producing goods. Those of us who have profound faith in the democratic system of government and the application of democratic processes in industry are convinced that collective bargaining can become one of the great bulwarks of our way of life because it also provides to employees the protection that cannot be denied them.

Now, under collective bargaining as we understand it, management has the same right to provide for management security as the union has for union security. This is a fact not well understood, particularly by managers new to the process.

Some mine managers have undoubtedly become almost terrified when a union was certified at their properties. They report in awe-stricken tones that the union delegation flung down a contract before them and said, "Sign it, or else." That is not collective bargaining and need not be yielded to. It is management's duty to make such demands on the union as are necessary to preserve the employer's ability to perform his functions. Collective bargaining is not a one-way street.

The question of just what constitutes "management security" is most fruitful of debate. Some will claim that the unchallengeable right of discharge is one of the necessary elements. Discipline is certainly a part of management's job. I should like to suggest the need to discipline employees be con-

ceived as a heavy management responsibility rather than an "unchallengeable right," which, as we all know, can be abused. If management retains not so much the right but the duty to discipline when the effective operation of the working force requires it, one need have no fears about the reviewability of disciplinary action through collective bargaining. Such reviewability is a necessary protection to employees. Admittedly such an approach makes harder going, but it emphasizes the professional competence of management.

## Management Security

With respect to this whole matter of management security, many executives would prefer to depend upon what they call the "common law situation." They feel they are better off in assuming that the rights they have held should not now be questioned by admitting they may be subject to collective bargaining or even to discussion. To no small extent, this attitude emanates from uncertainty as to what phases of management functions must be reserved, and executives should clarify their thinking on this point above all others.

The question of management security clauses will, I believe, be of vital importance after the war in defining the subjects that should be included in collective bargaining. In this connection there are two or three matters I would like to make particularly clear.

First, I want to point out that there is actually only one government restriction upon what may be incorporated in a collective bargaining agreement — namely that upon wages. But this one restriction is no reason why employer and employee should refuse to bargain or be unable to agree on many other clauses, such as seniority provisions. Nor can I understand why these parties will permit such questions to be resolved by a governmental agency. Such matters can obviously be disposed of most satisfactorily by the men most directly concerned.

Second, attention to developing self-reliant, government-free industrial relations should be given by top management. Too often these matters have been handled by personnel men far down on the organizational scale or by others who have had little experience with them.

Third, collective bargaining is a continuous day-to-day process and must be regarded by management as such. It does not end when the contract is signed. On the contrary, the everyday application of contract clauses, such as that covering seniority, is what really makes or breaks the bargaining relationship. Skill, patience, tact, and courage are demanded, and your own men are the best qualified for it. The War Labor Board cannot possibly undertake to solve your day-to-day operating problems.

Statesmanship of a high order is required to apply the general principles of the collective agreement to day-to-day situations. Foremen and shift bosses must be depended upon as important representatives of management, and they must be fully informed as to what the agreement seeks to accomplish.

On the union side, a great responsibility devolves upon the union's stewards or committeemen. The keystone of the whole structure of day-to-day bargaining is the relationship between foremen and committeemen, and the major part of the collective bargaining task must be carried by them. The importance to employers of the type of man that represents them as foremen and shift bosses cannot be overemphasized.

## Joint Bill of Rights

The unwillingness or inability of management, as well as of some unions, to recognize the importance of the day-to-day relationship is one of the major factors underlying the current wave of labor unrest. My personal belief is that much of the present unrest is not so much due to resentment against restrictions placed on wages as to a deep belief that collective bargaining is not being effectuated in the day-to-day process in line with the provisions of the labor agreement. This can be remedied only by a straightforward earnest effort by management, and labor, too, to make collective bargaining work.

In closing, I want to reiterate my firm conviction that collective bargaining is such an integral part of industrial life that it must be developed by the parties themselves. The government should not be asked by the parties to designate all the terms of the collective agreement, even in war time. That, it seems to me, is as important to labor as to management.

My hope for the future is that management in the mining industry, and in all industry, will come to regard collective bargaining as a joint bill of rights for employer and employee and a bulwark to free enterprise. If in this way the collective agreement can be developed as a protection to management and workers' fundamental needs and as an institution devoted to the public interest, a great future lies ahead. This is the real challenge to all of us.

## LABOR RELATIONS REQUIRE ATTENTION

***Engineering and Mining Journal*** **has become increasingly conscious in recent years that more and more of the time of its readers is being spent, directly or indirectly, in dealing with labor relations. This situation has grown until no magazine devoted to the mining industry can afford to ignore it.**

**Labor relations have become, and will continue to be, just as vital to mining as, for example, blast-hole drilling or flotation. A change in labor relations can affect a mining operation even more drastically than a change in mining method. The editors of *E.&M.J.* believe, therefore, that mining's labor relations should be discussed in the same impartial spirit and for the same purpose that better mining methods are presented.**

**The accompanying article by Dr. Taylor and our recent article by Mr. Gorsuch are the first of a group of worthwhile articles on labor relations to be published in *E.&M.J.* The editors invite the criticisms and contributions of members of the mining industry in the effort to build up a body of useful information on these perplexing problems.**

# Philippine Mining Is Expected to Resume

**JAMES S. BAKER,*** Washington, D. C.

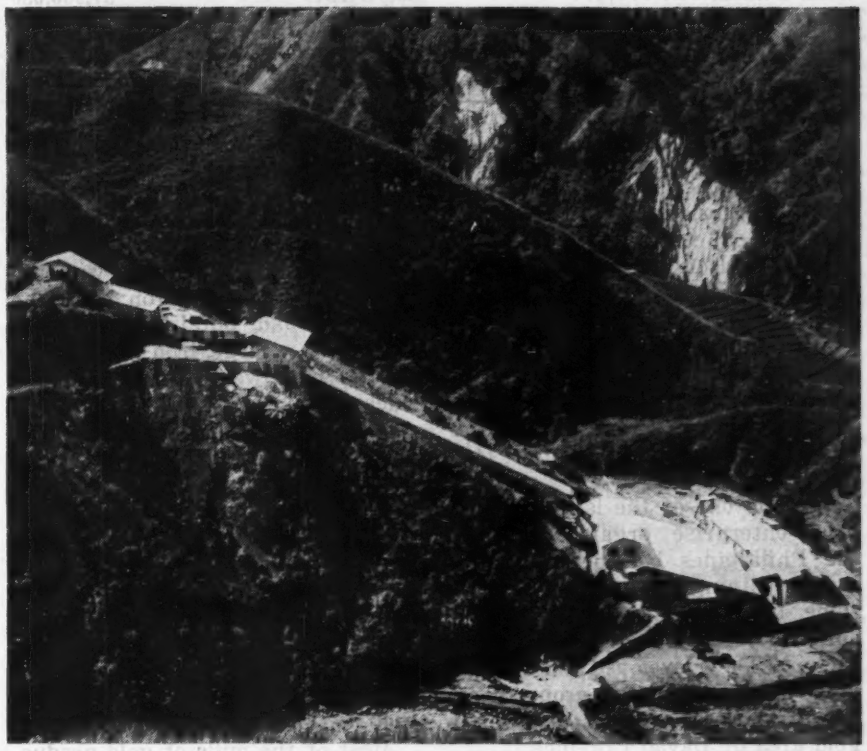
GOLD WILL PROBABLY CONTINUE to be the greatest value mining product of the Philippines. The early Chinese traders prospected for and mined gold. For more than three hundred years the Spanish continued the search for gold. After the Philippines were taken from Spain by the United States in 1898, Americans worked in the areas previously mined. The earliest lode operation in Luzon was on the properties now owned by Benguet Consolidated Mining Co. near Baguio, in the Mountain Province.

The early struggles of this company were numerous. Orebodies were found and lost. A cyanide plant was installed only to be washed out during a typhoon in 1911. As the fortunes of Benguet fluctuated, so in general did the interest of prospectors vary. Up to 1928 little actual impetus had been given to the industry as a whole. In that year Benguet began to expand. Its interests in Balatoc Mining Co. took on new importance after encouraging, favorable structures were found. Prospecting and exploration went further afield, and in 1932 a typical gold rush resulted.

Hundreds of mining companies were organized and thousands of people learned for the first time of the stock-market "gold mines." During this excitement, however, operations on favorable properties vindicated the judgment of engineers. New mills were installed at the Antamok Goldfields Mining Co., Baguio Gold Mining Co., and Suyoc Consolidated Mining Co.

A recession followed this boom, during which some companies ceased exploration and others eliminated from their large number of claims those of doubtful value.

Various interests prepared to organize new companies. Publicity given to favorable assays obtained in the course of exploration continued to stimulate the general interest in gold mining. In 1936 a second boom started which lasted for a little over one year, and resulted in exploration work throughout the archipelago.



**BEFORE PEARL HARBOR, Lepanto Consolidated Mining Co., whose 450-ton concentrator is shown here, was the only copper operation of importance in the Philippines. Its concentrate was shipped to Japan. The site is north of Baguio, in northern Luzon.**

It was during this second period of speculation that war clouds began to gather in Europe and interest in base metals increased. Discoveries of chromite, copper, and manganese were actively prospected and developed, and new deposits were located. The exploitation of these properties took on new importance.

All of this activity resulted in several organizations assuming the operation of companies and organizing others independently, under their own promotion. The Haussermann interests, Benguet Consolidated, and Balatoc Mining companies confined their work to their own properties, with the exception of one gold venture in Bulacan and one for chromite in Zambales.

During the early days of the 1932 uptrend in prospecting and speculation, the firm of Marsman & Co., organized in 1926, launched several subsidiary and allied companies to supply and operate mines; and for consultation service on operations and holding interests in several different fields. Notable operations resulting from these promotions were the Suyoc Consolidated, San Mauricio, and United Paracale companies, which took their places along with the Itogon Mining Co. The Coco Grove mining company was organized to operate an alluvial area in Camarines Norte, at the mouth of the Paracale River.

The Soriano mining organization began with the incorporation of Antamok Goldfields Mining Co. Others under its operation were the IXL Mining Co. the Masbate Consolidated Mining Co., involving the combination of several mining

*Member, A.I.M.E.

## Metals and Ores Exports

(Weight in Metric Tons. Value in U. S. Dollars)

| | 1939 | | 1940 | |
|---|---|---|---|---|
| | *Weight* | *Value* | *Weight* | *Value* |
| Chromite | 126,749 | $ 1,076,820 | 194,393 | $ 1,942,060 |
| Copper ore | 11,956 | 306,296 | 13,086 | 151,923 |
| Copper concentrate | 9,958 | 1,235,650 | 6,216 | 1,246,598 |
| Iron ore | 1,154,738 | 2,548,924 | 1,191,641 | 2,764,700 |
| Nickel ore | ..... | ..... | 2 | 60 |
| Manganese ore | 17,949 | 383,449 | 29,019 | 749,904 |
| Lead, metal and ore | 36 | 3,876 | 143 | 12,762 |
| Gold, bullion, etc. | | 35,878,281 | | 37,900,080 |
| Silver in bullion, etc. | | 948,388 | | 976,662 |
| Total | | $42,381,684 | | $46,744,789 |

properties on the island of Masbate, and the North Camarines Gold Mining Co. in Camarines Norte.

The Nielson organization was started as a holding and operating company during the 1936 boom. This company managed Paracale Gumaus Consolidated Mining Co., Lepanto Consolidated Mining Co., in the Mountain Province, and the Tinago Consolidated Mining Co., on Masbate.

In 1935 one of the larger industrial enterprise organizations in the Philippines became interested in the mining industry. The Elizalde interests included a steamship line, paint factory, and rope factory. They developed and started operations on an iron property on Samar, and a newly discovered gold area of Davao Province.

Outstanding among the independent groups were East Mindanao Mining Co., near Placer; Mindanao Mother Lode Mining Co., near the town of Surigao; Surigao Consolidated Co., near Lake Mainit, all in Surigao Province, Mindanao. Demonstration Gold Mines, in the Baguio district, had reopened an old property.

## Base Metals Also Sought

Among the base-metal organizations, Acoje, producing chromite of medium metallurgical and chemical grade in Zambales, was perhaps the most important. Some high-grade copper ore was produced by Nielson on Rapu Rapu Island south of Legaspi, Luzon. The Benguet Consolidated operation of the Consolidated Mines property in Zambales had proved up a large refractory chromite orebody inland from Masinloc.

The Luzon Stevedoring Co. secured control of or operating rights on several manganese properties in the Visayan Islands and was the largest exporter of manganese from the Philippines. The Philippine Iron Mines, near the town of Jose Panganiban, Luzon, was the largest exporter of iron ore. The Japanese had obtained operating control of a large iron ore deposit on the northwest slope of Mount Bucaycay, in the Paracale District.

The foregoing outline of activities in the Philippines of the main operating organizations indicates the scope of rehabilitation confronting the mining industry. The accompanying table is digested from the official Philippine Government statistics of exports. Mineral exports were approximately 27 percent and 30.6 per cent, respectively, of total exports in 1939 and 1940.

Most of the mills of gold-producing properties adopted the cyanide process. Some used gravity concentration and amalgamation, and some used flotation. They shipped concentrates to smelters in the United States.

In base-metal operations, various methods of beneficiation were applied. The large copper producer, Lepanto Consolidated Mining Co., operated a complex enargite gold-copper property utilizing flotation followed by roasting to remove a large percentage of the arsenic. The company had installed a small smelting plant for the production of blister copper. A high-grade matte had been produced in the few months following installation of the smelter, but it was expected that blister would be delivered.

No standardization of equipment had been achieved among the various operating organizations, although Dorr classifying, thickening, and agitating equipment was generally used. Crushing and grinding equipment was different in many of the mills, and occasionally several types and makes could be found in the same installation. Jigs of various types were installed in some plants. Wilfley pumps were the one item in which general standardization was effected, although the types and sizes differed in each plant according to the flowsheet. A complex equipment rehabilitation picture applies to the entire industry.

The approximate capacity of certain cyanide and flotation installations is tabulated below.

| | *Type* | *Tons Per Day* |
|---|---|---|
| Atok-Big Wedge | C-F | 350 |
| Antamok Goldfields | C | 800 |
| Baguio Gold | C-F | 250 |
| Balatoc | C-F | 2,000 |
| Batong Buhay | C | 150 |
| Benguet Consolidated | C-F | 1,200 |
| Davao Gold | C | 200 |
| Demonstration | C-F | 200 |
| East Mindanao | C | 125 |
| Itogan | C-F | 1,000 |
| Masbate | C-F | 4,000 |
| San Mauricio | F | 500 |
| Suyco Consolidated | C-F | 400 |
| United Paracale | C-F | 325 |

(C) cyanide, (F) flotation, (C-F) cyanide-flotation.

It generally was assumed that upon occupation of the Philippines, the Japanese would continue gold mining. However, it is rumored they had little interest in the gold operations. Active exploration and exploitation of the Lepanto copper properties did continue. Some information indicates the orebodies were considerably enlarged and the mill facilities expanded to exceed 1,000 tons per day. Copper ore was also shipped to Japan. The iron properties on Luzon and Samar may not have been operated, as it is probable that Japanese iron ore needs were supplied from other sources.

Usually, when a mill is closed down, the tanks are cleaned and the metal parts cleaned, oiled, and greased. The wood tanks are carefully preserved for future use. None of this care and maintenance of equipment could be applied to the operations in the Philippines subsequent to Japanese occupation, because the staffs were interned or in military service. The result is probable that most of the tanks and much of the equipment will be unusable after reoccupation, if not looted by the Japanese.

A number of the mines were shaft operations, and those which were not entered through shafts were accessible by adit. Continual timber replacement and mainte-

ITOGON MINING CO. had the largest thickener, 90 ft. in diameter, in the Islands at its cyanide plant in the rugged Baguio district. At the time of writing this area in Luzon is still in the hands of the Japanese.

nance is required in most mines. Many of the important workings and shafts will be caved and, where partially open, the timber in the workings will have rotted. A colossal and costly job of rehabilitation will face the companies which wish to resume operations.

After reoccupation is reasonably complete in the mining areas, the Filipino people must be given employment. If they are to be reemployed in the mining industry, the equipment, supplies, and reagents must be furnished to permit reopening of the properties. Reports indicate that the Japanese have plundered many of the installations, particularly those with large power and milling capacities which were readily accessible; such as Benguet Consolidated, Balatoc and Itagon.

## War Damages Mines

Some say that most of the diesel engines from these two companies were shipped to Japan or sent to the Lepanto copper operation. All mining companies in the Islands maintained heavy inventories of expendables such as rails, balls, spare parts, belting, hose, nails, and drill steel. It is probable that Benguet and Balatoc combined inventories were approximately $1,500,000 at the time of the invasion. Other companies had a proportionately large total inventory.

The first need, of course, will be rehabilitation of the underground workings. Probably several million feet of underground timbers will be required for shafts, drifts, crosscuts, and various raise workings. Douglas fir was imported in large quantities for this purpose. Additional timbers were shipped into the various mines from local lumber operations. At present the timber shortage in the United States will require that rehabilitation timbers come from Philippine sources. It is probable that in a reasonable period of time logging operations in the Mountain Province, in Laguna Province, Masbate, and Camarines Norte will supply a limited amount of underground timber. However, war needs will undoubtedly take precedence over many industrial needs.

The employment of workmen in retimbering and reopening of the underground workings can be of material benefit to the people of the mining areas. No benefit will accrue to the shareholders of the various companies until after the many needed items for repair and rehabilitation of the surface mining plant and mill facilities are provided. There is no doubt aside from the physical equipment required that pipe lines, cableways, and even surface buildings must be renewed.

The large expenditures involved cannot be met at one time or even over a short period of time from the cash resources of the mining companies alone. The financial rehabilitation of the various mining corporations is a very involved problem. Undoubtedly, there will be claims against the Japanese government for plundering and destruction. There may be some claims with the U. S. government for war damage, although these may be of a minor nature. However, if the War Damage Insurance Act is extended by Congress to cover losses in the Philippines through the exigencies of war subsequent to the expiration of the free period in 1942, there will be capital available for the huge task facing the mining companies when accountings are approved for payment.

Few of the companies maintained offices in the United States. Those which did probably held cash balances or liquidations for shipments which would provide some funds. The companies which did not have offices in the United States and whose financial position was reflected by books and accounts in the Philippines may find a very trying period of tracing the books or of setting up new books to prove their position as of Dec. 8, 1941.

## Mining Is Vital

Allied with the mining industry to a considerable extent were various corporations in Manila and other principal cities of the archipelago. Steamship lines received large revenues for inter-island transport of supplies. The Manila Railroad Co. transported huge tonnages of supplies each year. Importers and exporters thrived on business done with the mining industry. Substantial light manufacturing and steel fabrication and forging were handled by several companies in the Manila area. These companies will again thrive when mining is resumed.

The Philippine government will undoubtedly face many social and financial problems in areas where mining was the dominant industry. Minimum wage and hours laws are definite. Forestry regulations and reforestation must be continued. The production tax and mining income tax must be maintained to provide the government with revenues. However, it will be necessary to give full consideration of regulatory decrees and laws before their enactment, in order to permit the mining industry to again become one of the principal sources of revenue for the Philippine government.

# Unexpected Use Transforms Outlook for Quicksilver

**H. H. WANDERS,** Market Editor

THE AMAZING PERFORMANCE of the quicksilver market during the war period stands out boldly in an otherwise well-regimented price situation. In fact, there has been sufficient action in quicksilver prices since 1939 to start a first-class witch hunt by those unfamiliar with the peculiar problems of the industry. Actually, there is no mystery about the metal's wide price swings and the production record.

Early in the war period the price advanced sharply because it was thought that domestic production would have to carry the full weight of an enlarged war program. The price jumped from $88 per flask of 76 lb. as war broke out all over Europe in 1939, to $200 as 1941 ended. The Office of Price Administration stepped in early in February 1942 and set a ceiling price that was only slightly below the top figure that obtained in the United States market. Those who favored a high ceiling believed that a generous price would have to prevail to bring out the metal in quantity.

High prices lifted production. Output of quicksilver in 1939 amounted to 18,600 flasks. Four years later (1943) production climbed to 52,000 flasks, the highest annual rate attained since 1882. Peak production in this country was 79,400 flasks in 1877, and the low was 6,340 flasks in 1921.

Up to the middle of 1944 the war demands for quicksilver failed to come up to expectations, and supplies accumulated. The price turned weak and moved downward over the first half of 1944, touching $97 per flask, New York, in June of that year, about $100 per flask below the ceiling level. The price was well on its way to the prewar level when buying interest suddenly appeared, and some highly optimistic estimates on probable requirements were mentioned in market circles. A new use was responsible for the unexpected change. The market advanced to $140 per flask before 1944 ended.

The mysterious new source of quicksilver consumption turned out to be a small mercury oxide dry cell developed for the Army for use in the tropics, and big things are claimed for the new cell. It possesses long shelf life, about five times that of the common dry cell, and stands up under such trying operating conditions as heat and high humidity. Makers say the cell delivers a constant voltage until exhausted.

Construction is along radically different lines from those employed in making the common dry cell. The components are red oxide of mercury, a thin ribbon of zinc, specially prepared paper, and a steel container. The zinc and paper, along with the oxide, are rolled into a spiral to fit into the container. The cell is hermetically sealed. Initial production centered in a cell about the size of a dime in diameter and three-eighths of an inch high. A radio battery constructed for the Signal Corps, rated at 93.6 volts, contained 72 of these tiny cells and weighed two pounds.

Some observers contended that the new use will absorb more of the metal than any other classification heretofore accepted as an important outlet for quicksilver. Unless the battery program is cut back for one reason or another, demand for quicksilver over the remainder of 1945 will increase to a point where augmented domestic production and large importations will be needed to meet the requirements. One of four plants now producing the dry cell went on record early this year with a statement to the effect that the Signal Corps has requested the company "to quadruple its production."

To expand domestic production without obtaining a clear picture of what lies ahead presents a puzzling problem for domestic mine operators. The price has risen sufficiently in recent months to revive marginal production. However, absence of official word on the size and duration of the battery program, together with some uncertainty about other outlets for the metal, tends to make producers think twice before expanding output.

Early this year the price appeared to be marching right back to the ceiling level, with sellers asking from $167 to $172 per flask, New York. Attractive prices brought out larger offerings from foreign producers. First there was Canadian metal, then Mexican, and finally Spanish quicksilver. When Spanish metal was sold for March shipment from abroad at $155 per flask, duty paid, New York, various domestic producers raised the cry of "dumping." Later, April shipment quicksilver was offered by Spanish interests at $152.

Experts insist that consumption of quicksilver in 1945 will be substantially higher than in recent years, owing to the new use for the metal, and the price for the current year will average well above the 1944 level.

## QUICKSILVER STATISTICS

| | *U. S. Production* (a) | *Price, N. Y., Per Flask* (b) |
|---|---|---|
| 1939 | 18,633 | $103.94 |
| 1940 | 37,777 | 176.87 |
| 1941 | 44,921 | 185.02 |
| 1942 | 50,844 | 196.35 |
| 1943 | 51,924 | 195.21 |
| 1944: | | |
| January | 4,400 | 151.60 |
| February | 3,800 | 130.00 |
| March | 3,800 | 130.00 |
| April | 3,700 | 128.20 |
| May | 3,400 | 115.54 |
| June | 3,000 | 101.69 |
| July | 2,700 | 100.56 |
| August | 2,500 | 104.04 |
| September | 2,500 | 104.28 |
| October | 2,700 | 109.20 |
| November | 2,300 | 116.30 |
| December | 2,500 | 128.88 |
| | 37,300 | (c)118.36 |
| 1945: | | |
| January | 2,500 | 156.85 |

(a) In flasks of 76 lb. Estimated by Bureau of Mines. (b) *E. & M. J.* averages. (c) Average for 1944.

# Centralized Washing For Hard-Rock Phosphate

**T. D. FELTON,** General Superintendent, C. & J. Camp., Inc., and J. Buttgenbach & Co., Lakeland, Fla.

### Facts About Florida's Hard-Rock Phosphate Field

Wholly separate from the pebble phosphate field[1] of Florida the center of which is about 30 miles east of Tampa, the so-called "hard-rock" phosphate area of the State comprises a belt about 100 miles long and 2 to 30 miles wide that extends from Suwanee and Columbia counties in the north southward to Hernando County. The deposit includes, in what is locally called the "matrix," sand, clay, phosphate rock, and occasionally flint and lime rock. The phosphate particles vary in size from that of a grain of sand to boulders as big as an automobile. In a few cases the boulders have been as large as 25 ft. in diameter.

In the course of the evolution of the stripping and mining practice the overburden in the early days was removed with mules and scrapers, then with small steam shovels and cars, and finally by hydraulic methods which have ranged from the use of 8-in. pumps driven by 75- to 100-hp. motors at the start to employment of the present-day 12-in. units and 450-hp. motors. Similarly, the matrix was first mined with picks and shovels, then with small power shovels, followed by steam-driven dipper dredges, and finally with modern electric draglines and shovels, as currently used.

Prospecting procedure differs greatly from that employed in the pebble field, owing to the erratic occurrence of workable matrix. Standard prospecting requires about 16 holes per acre (spaced approximately 50 ft. each way), whereas in the pebble field the standard procedure calls for only 16 holes in 40 acres. The holes are put down to depths as great as 125 ft., using machine-operated jet drills.

The principal mining companies in the hard-rock field are C. & J. Camp, Inc., of Ocala, Fla., and J. Buttgenbach & Co., of Lakeland, Fla., which are operated as one company under one management. The new washing plant recently erected at the Section 12 mine, about 3 miles southeast of Dunnellon, is here described. It is the largest and most modern ever built in this field.

Washed phosphate produced in the hard-rock field is shipped by rail to the port of Fernandina, north of Jacksonville, on the East Coast. Here it is dried and stored and eventually loaded into vessels for shipment abroad. At Fernandina there are storage facilities for 30,000 tons of dry rock and up to 100,000 tons of wet rock.

ABOUT TEN YEARS AGO C. & J. Camp, Inc., and J. Buttgenbach & Co., operating in the hard-rock phosphate field of Florida, began the practice of building portable steel plants for primary washing at their phosphate mines. The product of these plants was then hauled to a central plant for the final washing before shipment. By the middle of 1943 mining had been completed within a radius of several miles of the central plant, and the companies decided to locate both the primary and central washers at a point where they have deposits sufficient for several years of mining. Improved hauling methods would permit them to bring matrix to the new plant from several miles away. At the place selected the new Section No. 12 mine, with its large and modern washing plant, is now in operation. In the following description emphasis is laid on the improvements that have been made.

At the mine the overburden is removed by hydraulicking with guns supplied with water under pressure by a Hydraucone pump capable of delivering 5,000 g.p.m. at 525 ft. head. This material is pumped to disposal by a 12-in. G.I.W. volute-type dredging pump, driven by a 450-hp. motor. The phosphate matrix is then attacked with a 3-cu. yd. Monighan dragline, which loads it into a 7-cu. yd. skip car, which delivers it to the washing plant.

In the accompanying flowsheet are shown the successive steps in the washing process, beginning with the receipt of the matrix from the mine at the plant hopper.

## The Flowsheet

The skip car is hauled up the plant incline with a ¾-in. wire rope and dumped on to the rolling grizzly in the hopper. The grizzly is held stationary during dumping and the control gate below is kept

[1]The pebble field which yields the larger part of the phosphate production of the United States has been extensively described and discussed in the series of articles entitled "Phosphate—The Vital Non-Metallic," published in *Engineering and Mining Journal* beginning with the issue of September 1940.

closed by the weight attached to it. The gate is then raised by a 5-in. air cylinder, the hydraulic gun, discharging 500 g.p.m., is played at the base of the matrix, and the grizzly rolls are rotated slowly by start-and-stop, pushbutton control until all the small material has passed the 6-in. openings. There are 13 corrugated rolls on a 20-deg. slope, followed by six smooth rolls on a 10-deg. slope. The smooth rolls are 8⅝ in. in outside diameter and are set 10 in. apart, c. to c. They function as a conveyor for the large pieces of clay, flint, and lime rock, 6 to 24 in. in size, which are removed and dropped into a chute at one side, sliding down it to a top-conveying chain, which delivers to a Koehring Dumptor for disposal several hundred feet away. The pieces of phosphate that pass over the smooth rolls drop into a single-toothed roll crusher 24x54 in. in size, set for about 7 in.

The crushed product joins the grizzly undersize and goes to a conical screen with 1¼-in. openings. The screen has an internal spray pipe, which delivers about 1,000 g.p.m. of water, making, with the hydraulic gun water and the water introduced in the tub below the grizzly, a total of about 1,750 g.p.m. to pass with the minus 1¼-in. material to the sump box. The plus 1¼-in. material goes to a picking belt.

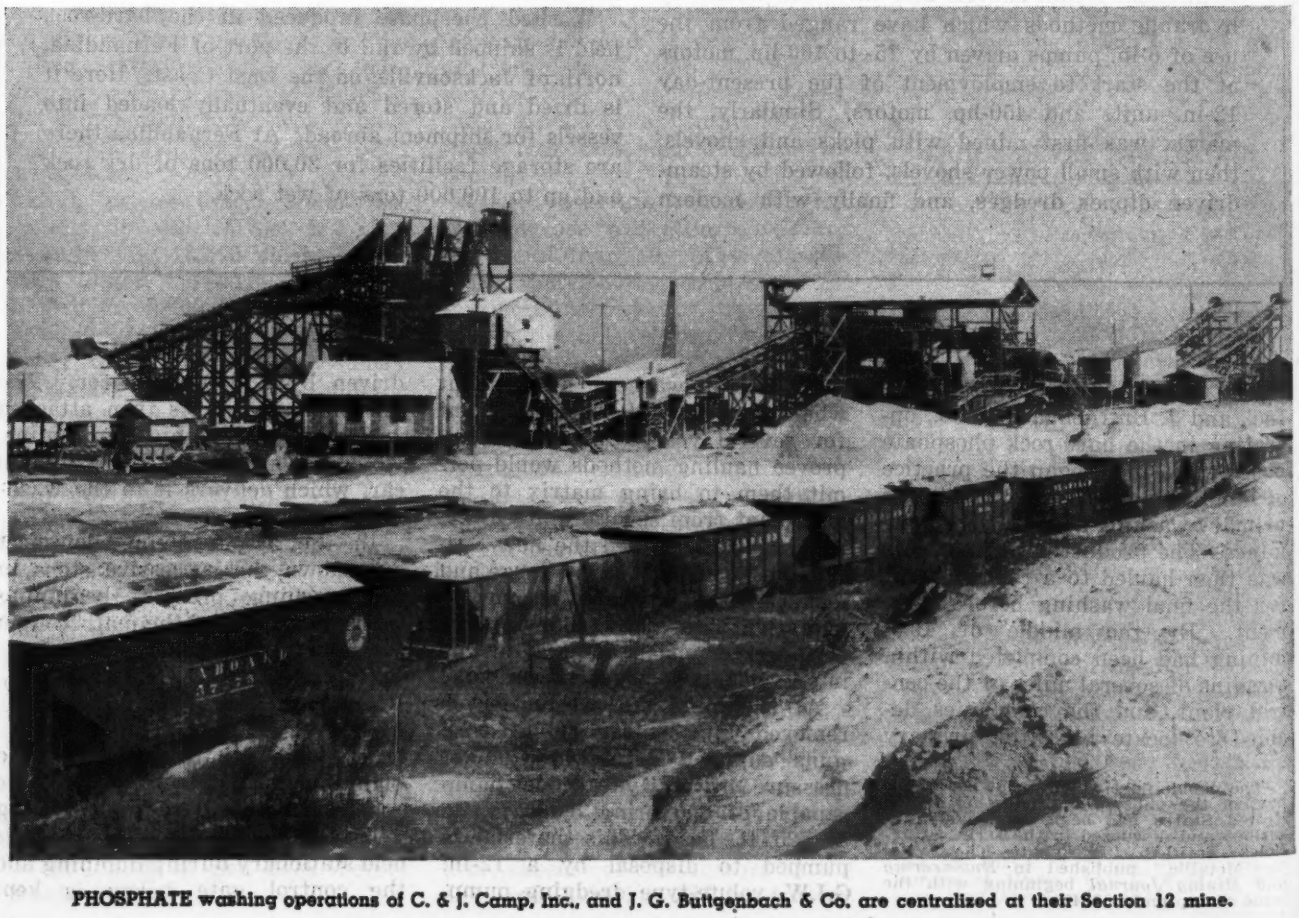
From the sump box water and solids are pumped to a double-deck screen. The top deck of punched plate with ⅜ x 1-in. openings is used to keep the large material from falling on the 10-mesh wire cloth of the second deck. Oversize from both decks goes into a duplex log washer and the undersize to a hydroseparator. The 8-in. sand pump is driven by a 100-hp. motor with a wound rotor and C.I. grids for speed control. Resistance in the secondary circuit is controlled by magnetic contactors actuated by float-operated mercury switches.

## Hand Picking Necessary

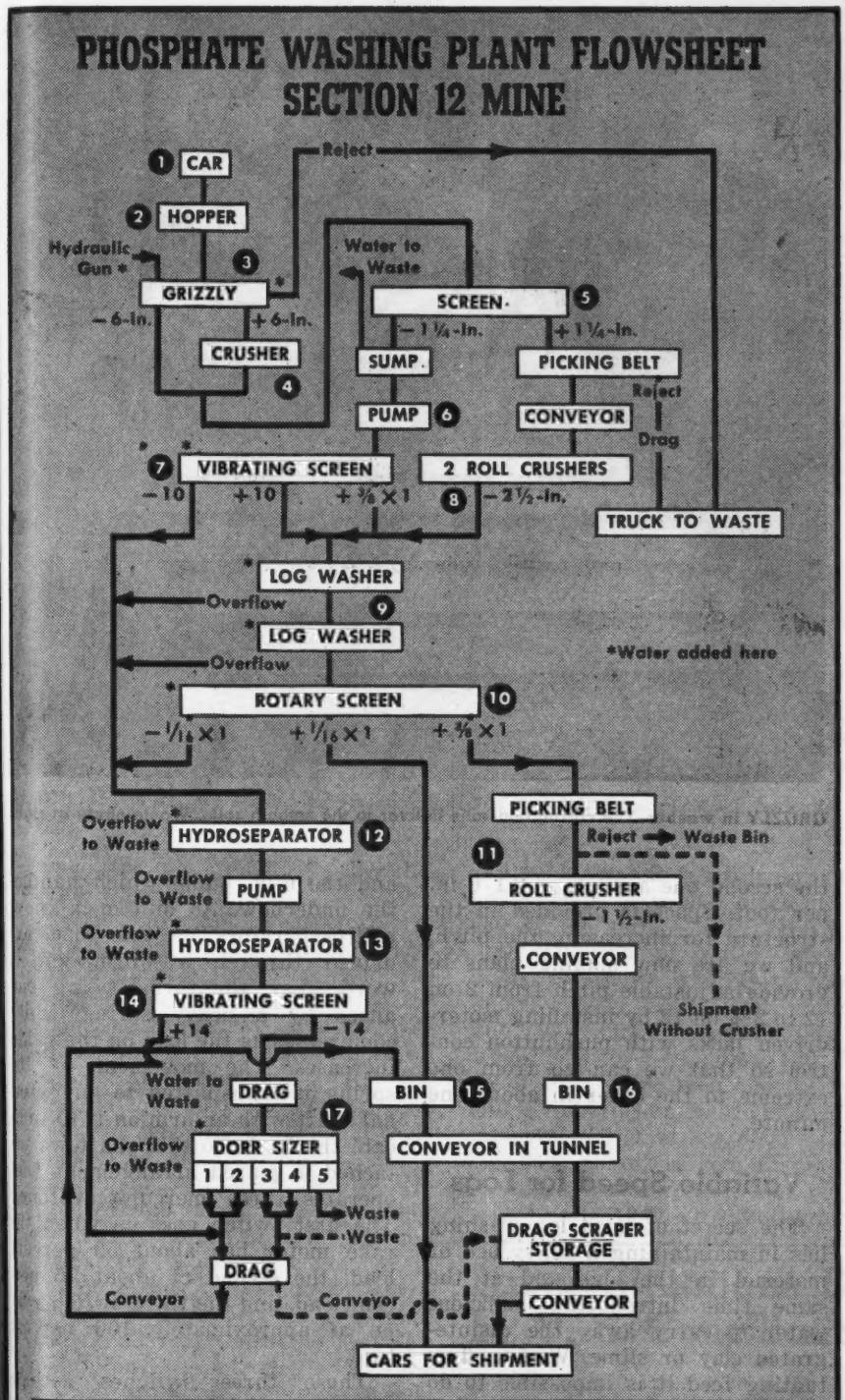
From the picking belt that follows the conical screen, usually eight, but at times nine or ten, men and women remove clay balls, flint and lime rock, rolling them off the edge. This reject falls to a double-chain bottom-conveying drag, which discharges into the same Dumptor truck mentioned previously. By use of bend pulleys the return side of the belt is dropped several feet to allow room for the hopper and drag that conveys the reject. The picking belt discharges to a 30-in. conveyor and this to two single-toothed-roll crushers in parallel set for 2½ in. The crushed product goes to the same log washer that receives the oversize from the vibrating screen. From this log the material goes to a second log washer and thence to a rotary screen, which has an inner shell of ⅜x1-in. punched plate and an outer shell of 1/16x1-in. punched plate. This screen has an inside spray pipe delivering about 1,200 g.p.m. of water. The underside from the outer shell goes to the hydroseparator with the overflow from both logs.

The inner-shell oversize goes to a picking belt, which, near its upper end, has the same arrangement as the other picking belt for removing flint, lime, and the occasional clay balls that are not disintegrated by the logs. The reject is conveyed to a small bin for disposal later by truck. On this belt we use six to eight women.

This belt discharges to a 24x36-in. fluted-roll crusher set to 1½-in. The crusher can be opened, so as



**PHOSPHATE washing operations of C. & J. Camp, Inc., and J. G. Buttgenbach & Co. are centralized at their Section 12 mine.**




### LEGEND

1. Skip-car, 7-cu. yd
2. Receiving hopper. Discharge control gate closed when dumping
3. Grizzly of 13 corrugated rolls on 20-deg. slope, with 6-in. openings, followed by 6 smooth conveying rolls on 10-in. centers
4. Single-toothed-roll crusher, 24x54 in., set to approximately 7 in.
5. Conical screen, single-shell, 6x7x14-ft., openings 1¼-in. in dia.
6. Georgia Iron Works, 8-in. sand pump, 100-hp. motor
7. Vibrating screen, 4x12 ft. Allis-Chalmers, double-deck, Type B.
8. Two single-toothed-roll crushers, one 24x36-in., one 24x24-in. Set for 2½ in.
9. Two duplex log washers, 30-ft., McLanahan & Stone, speed adjustable and pitch to be made so.
10. Rotary screen—inner shell, ⅜x1-in. holes; outer shell, 1/16x1-in. holes
11. Fluted-roll crusher, 24x36-in., set to 1½ in.
12. Hydroseparator, 20-ft. Delivers by 6-in. pump to 13 following
13. Hydroseparator, 10 ft.
14. Vibrating screen, 4x12 ft., Type B. Allis-Chalmers, single-deck, 14 mesh.
15. Cylindrical bin, 16½x28 ft.
16. Cylindrical bin, 25x25 ft.
17. Five-pocket Dorr sizer

to do no crushing if the customer prefers coarse rock, or if the phosphate is to be crushed to ½ in. at the Fernandina plant for acidulation. The crushed product is conveyed to a cylindrical bin. Oversize from the outer shell of the screen is stored in an adjacent bin. The two bins will hold one day's production to permit analyses to be made before loading into hopper-bottom cars for shipment to Fernandina to be dried there or to be stored wet. In a concrete tunnel under the bins there is a 30-in. conveyor which serves for loading cars or for transferring to drag-scraper storage. The product from these bins can be shipped or stored separately or blended as desired.

## The Hydroseparators

As shown in the flowsheet, the undersize from the vibrating screen, the overflow from the two logs, and the outer-shell undersize of the rotary screen go to a 20-ft. hydroseparator, the overflow of which is delivered to waste. The underflow is pumped to a 10-ft. hydroseparator. From the latter the overflow goes to waste and the underflow by gravity through a hand-controlled valve to a vibrating screen having one deck of Ton-Cap wire cloth equivalent to 14 mesh. Screen undersize is sent to a dewatering drag, which feeds a five-pocket Dorr sizer. The sizer overflow and the product of the last pocket go to waste. Products of pockets 1 and 2 go to still another drag, serving only to dewater, and the product from pockets 3 and 4 also may be directed to this drag or to waste by simply throwing a small lever. The screen oversize also is delivered to this drag. The latter's dewatered product discharges to either of two belt conveyors, one of which will transfer it to the belt delivering to the 16½x28-ft. bin, and the other of which will take it to drag-scraper storage. The grade of this material ranges from 73 to 76 percent bone phosphate of lime (B.P.L.) and in size from minus-10 to plus-48 mesh.

Water for washing is pumped 2,200 ft. through pipe lines to the booster pumps at the plant. Static head from water level to ground level at the plant is approximately 80 ft. One primary pump has a capacity of 3,000 g.p.m. at 125-ft. head and the other a capacity of 2,500 g.p.m. at 135-ft. head. For

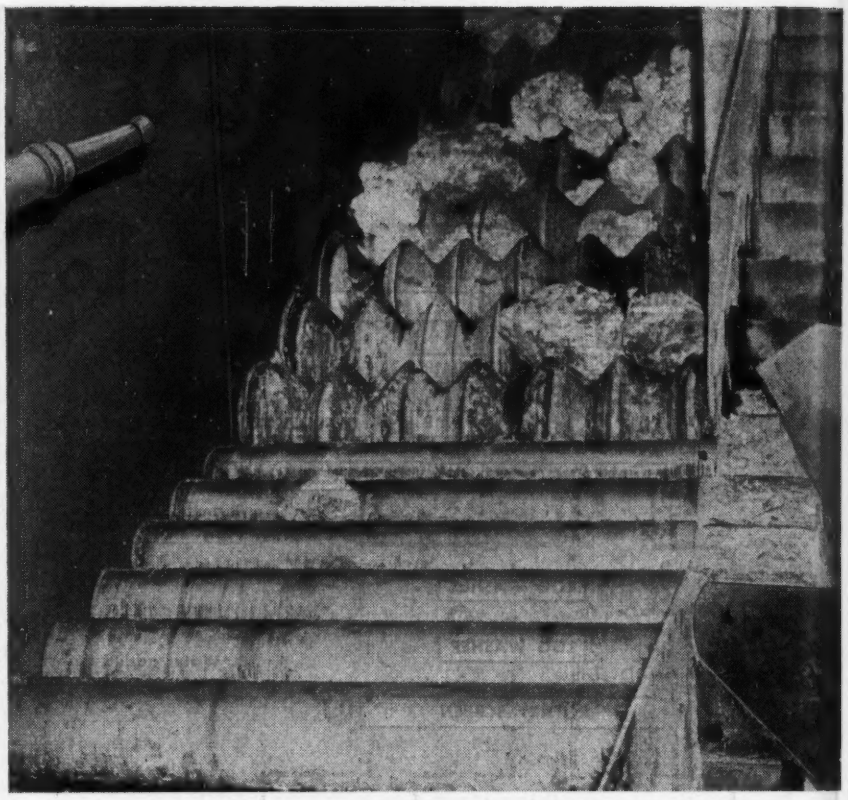
1,000 ft. the water is conveyed through two separate lines made up of 10-in. and 12-in. pipe in each line in the right proportion to give equal pressure from each pump where the two lines converge into one 18-in. line for the last 1,200 ft. to the plant. At the plant there are four 8-in. booster pumps, two in series producing 250 ft. of head for the grizzly gun at the hopper and the spray in the conical screen and two in parallel producing a head of about 80 ft. for the rest of the plant. Total water consumption for the plant is estimated to be 5,500 g.p.m.

## A Clay Problem

Having spent twenty-odd years mining pebble phosphate in Florida, I thought I knew something about clay, but after working in the hard-rock field for six years I have come to the conclusion that the clay problem in the pebble field is mere child's play compared to what we encounter here at times. In the pebble field the clay balls range from pea size to the size of a hen's egg, and I have seen many sets of logs that failed to remove a satisfactory amount of the clay. In the hard-rock field, however, after using 10 to 12 persons on the grizzly and picking belt to hand-pick the material to be washed before it reached the logs, at times we have a large quantity ranging from pea size to 6 in. in diameter. For this reason, much thought was given to the problem of disintegrating clay before we decided on the equipment for Section No. 12 washing plant.

In our work just prior to planning for this plant we used a blade mill at the primary washer, which was not satisfactory, and at the secondary washer we had the old-style wooden logs on a low pitch and slow speed. However, we had a helpful condition then that we do not have now, which derived from the soaking and disintegrating action which we automatically got in cars, the material remaining in the cars for a period of one to three days in moving between the primary and secondary washers. Now, the raw clay that we do not pick out by hand goes directly to the logs.

We finally decided to eliminate the blade mill and install two sets of 30-ft. duplex McLanahan & Stone logs in series. The first of these logs (shown in the flowsheet) has a pitch of 2 in. per foot and the second one a pitch of 2 1/6 in. per foot. Space is provided in the structure for increasing the pitch, and we are now making plans to provide adjustable pitch from 2 on 12 to 2⅜ on 12 by installing motor-driven jacks with pushbutton control so that we can go from one extreme to the other in about one minute.



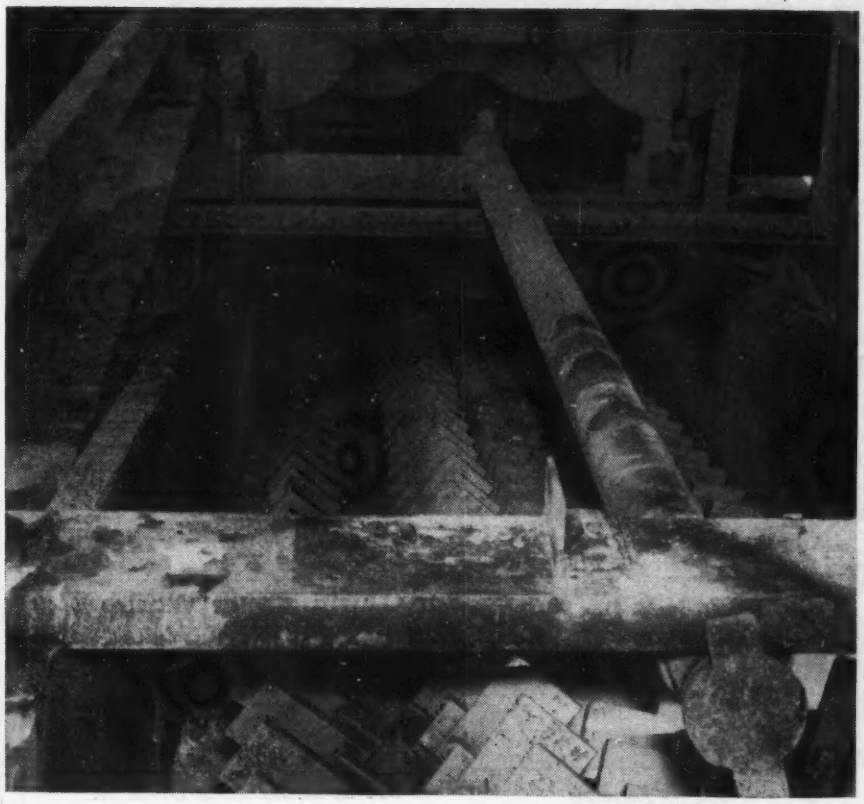
**GRIZZLY in washer. The corrugated rolls deliver to the smooth rolls. Waste chute at right.**

## Variable Speed for Logs

The secret of good log washing lies in maintaining a heavy bed of material in the logs and at the same time introducing sufficient water to carry away the disintegrated clay or slime. With a fluctuating feed it is impossible to do this unless you have variable speed or adjustable pitch, preferably both. We can vary the speed of our logs from 20 r.p.m. to 35 r.p.m. When the feed slackens or stops for a few minutes, 20 r.p.m. will hold the bed for about 15 minutes, and when we get adjustable pitch we can increase the pitch to where 20 r.p.m. will not make the log discharge at all. So far as I know this is the first time that logs have been operated with variable speed in the phosphate field.

Equipment has been designed and installed for automatically controlling the 20-ft. hydroseparator and the 6-in. pump which handles the underflow. As mill men know, hydroseparators of this size are driven through a worm and a worm gear, the thrust being balanced by a heavy spring which compresses as the load on the rakes increases. The movement of the spring is transmitted to an external shaft with an arm on it to indicate the load. To this shaft we attached a geared arrangement that operates three mercury switches. The first switch goes on when the rake motor has about 50 percent load, the second at about 75 percent load, and the third switch goes on at approximately 100 percent load.

These three switches actuate three magnetic contactors, which control the secondary circuit of the motor driving the 6-in. pump. The pump is started with sufficient resistance in this circuit to turn it at the correct speed to handle the feed up to the point of loading the rakes to about 50 percent of the capacity of the motor driving the rakes, which we will call No. 1 running position. From here on it is a simple matter to use the magnetic contactors for starring out resistance up to full motor speed, except that some adjustment has to be made, for No. 1 running position, to take care of increased slip



ONE SET of the two duplex log washers. Speed is adjustable and pitch will be made so.

when the pump and impeller become worn.

With three-pole contactors resistance can be cut out by bridging instead of starring, and the controller will still be effective for adjustments, but we have two-pole contactors, and to make a hook-up permitting adjustment with the manual controller still effective, we use two sets of C.I. grids in parallel. One set, say No. 1, has a permanent star with the conventional drum controller. The other set, No. 2, is open to start with and ineffective. With the controller in the off position, the motor is started and, if necessary, the resistance can be adjusted with the first few points on the controller to give the No. 1 running position, already mentioned. When the first magnetic contactor goes in, it closes the star on the second set of grids, which puts the two sets in parallel, thus reducing the resistance in the rotor circuit of the motor, which increases the pump speed. The second magnetic contactor cuts out half of the second set of grids, and the third contactor closes the star on the leads to the rotor, advancing the motor to full speed, which is more than ample to take care of our maximum condition. This control equipment is started at the beginning of the shift, and no one has to touch it until the hydroseparator is shut down at the end of the shift.

Distribution of water is estimated as follows: Conveying water under grizzly, 250 g.p.m.; grizzly gun, 500; spray in conical screen, 1,000; seal for 8-in. pump, 150; 10-mesh vibrating screen and the two single-roll crushers ahead of the log washers, 200; first log, 500; second log, 250; rotary screen, 1,200; 20-ft. hydroseparator, 400; 6-in. pump seal, 100; 10-ft. hydroseparator, 100; vibrating screen following the hydroseparators, 200; final dewatering drag, 50; Dorr sizer, 500; conveying water from sizer, 100. This gives us a total of 5,500 g.p.m.

## Plant Capacity Varies

In accordance with customers' requirements, the plant is able to furnish products varying in particle size from 48 mesh to 2½ in., with grades from 75 to 80 percent bone phosphate of lime (B.P.L.). Plant capacity, in terms of finished product, varies from 20 tons per hour in very lean matrix to 60 tons per hour in rich matrix, with a probable average of 40 tons per hour, which means an annual capacity of better than 100,000 tons. It is interesting to compare this with conditions 25 years ago, when plant capacities were 15,000 to 25,000 tons per year. At that time the operations at each mine were, of course, on a smaller scale and it was necessary to operate several mines to have the equivalent of one present-day mine. The total electrical load for a mine using a steam-driven dipper dredge 25 years ago was around 600 to 700 hp. Our electrical load for stripping the overburden, mining, and washing is about 2,500 hp.

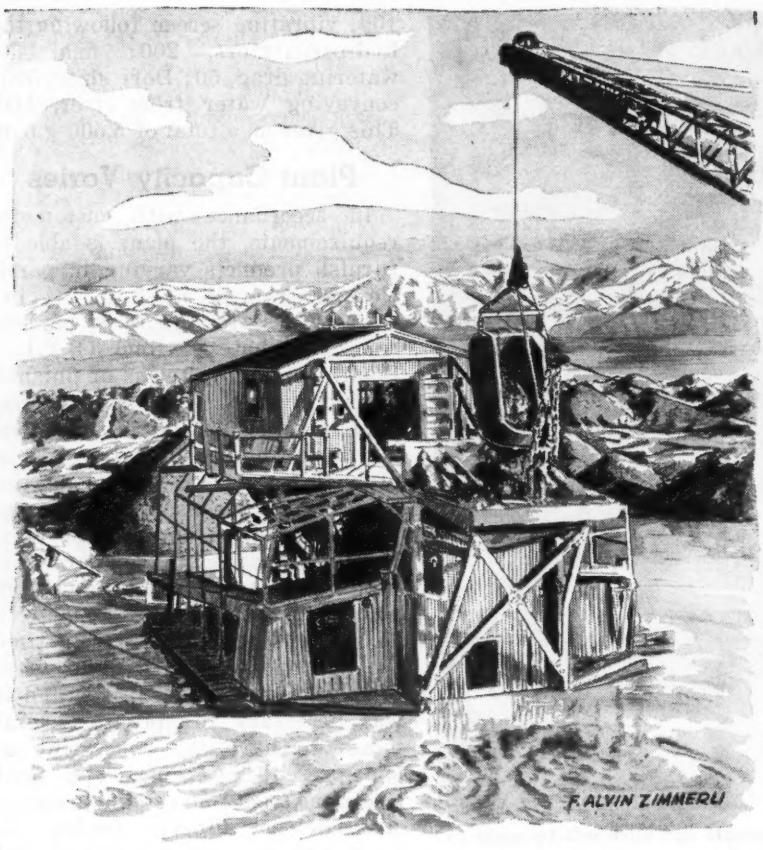
Instead of continuing to load directly into skip cars with the 3-W Monighan dragline, after we have mined approximately one acre we expect to use a Marion Type 37 electric shovel for digging the matrix and loading into Koehring Dumptors which will haul to a fixed point to dump into the skip cars. Some of the deposit which is below water level will have to be mined with a dragline.

# Labor Situations Disposed of by U. S. Conciliation Service in 1945*

(For industries engaged in mining and treatment of metallic and non-metallic minerals, not including fuels.) Voluntary methods are used in all types of situations listed. The great majority of disputes, including arbitrations, are settled at conference tables.

| *Type of Situation* | *Number* | | *Workers Involved* | |
|---|---|---|---|---|
| | *Jan.* | *Feb.* | *Jan.* | *Feb.* |
| **Labor Disputes** | | | | |
| Strikes and lockouts | .. | 1 | .... | 275 |
| Threatened strikes | 2 | 2 | 615 | 240 |
| Controversies | 12 | 11 | 5,712 | 1,661 |
| **Other Situations** | | | | |
| Arbitrations | 2 | .. | 2 | .... |
| Special services | 3 | .. | 92 | .... |
| Total | 19 | 14 | 6,421 | 2,176 |
| Disputes certified to WLB | 8 | 8 | 3,911 | 1,545 |

*Special report to *E. & M. J.* by Magazine Service Section, Department of Labor.




# WAR and GOLD

## Gold Production of California in Relation to World War I, and Its Course Preceding and During This World War

**CHARLES WHITE MERRILL**
Chief Engineer
Metal Economics Division
U. S. Bureau of Mines

GOLD MINING in the United States has suffered so seriously in the present war that its future has become a matter of much speculation. Forecasts concerning the industry have had the widest range. Some hold that the enormous strains placed by war on the monetary systems and credit of the belligerents will make necessary a return to gold as a measure of value if postwar fiscal chaos is to be avoided. Many in this group envision a price for gold far above $35 per fine ounce. At the other extreme are those who believe that the monetary systems of the great commercial nations have outgrown their need for gold; consequently they see no reason to take any action that would stimulate its production.

### California Best Example

Production figures have been confined to the industry in California, partly because California data are more easily available but also because California figures are preferable to others on some counts. California gold output comes almost entirely from straight gold mines. Thus, the depressing effect of war on the gold industry is not obscured by the output of byproduct gold from war-stimulated base-metal mines. California offers a good average picture because no giant, like the Homestake mine, in South Dakota, for example, dominates the scene. Moreover, there is a large development of both the lode and placer type of mine. Finally, California, the "Golden State," was the first to provide large-scale gold production and has been the country's leading producer almost continuously since 1848.

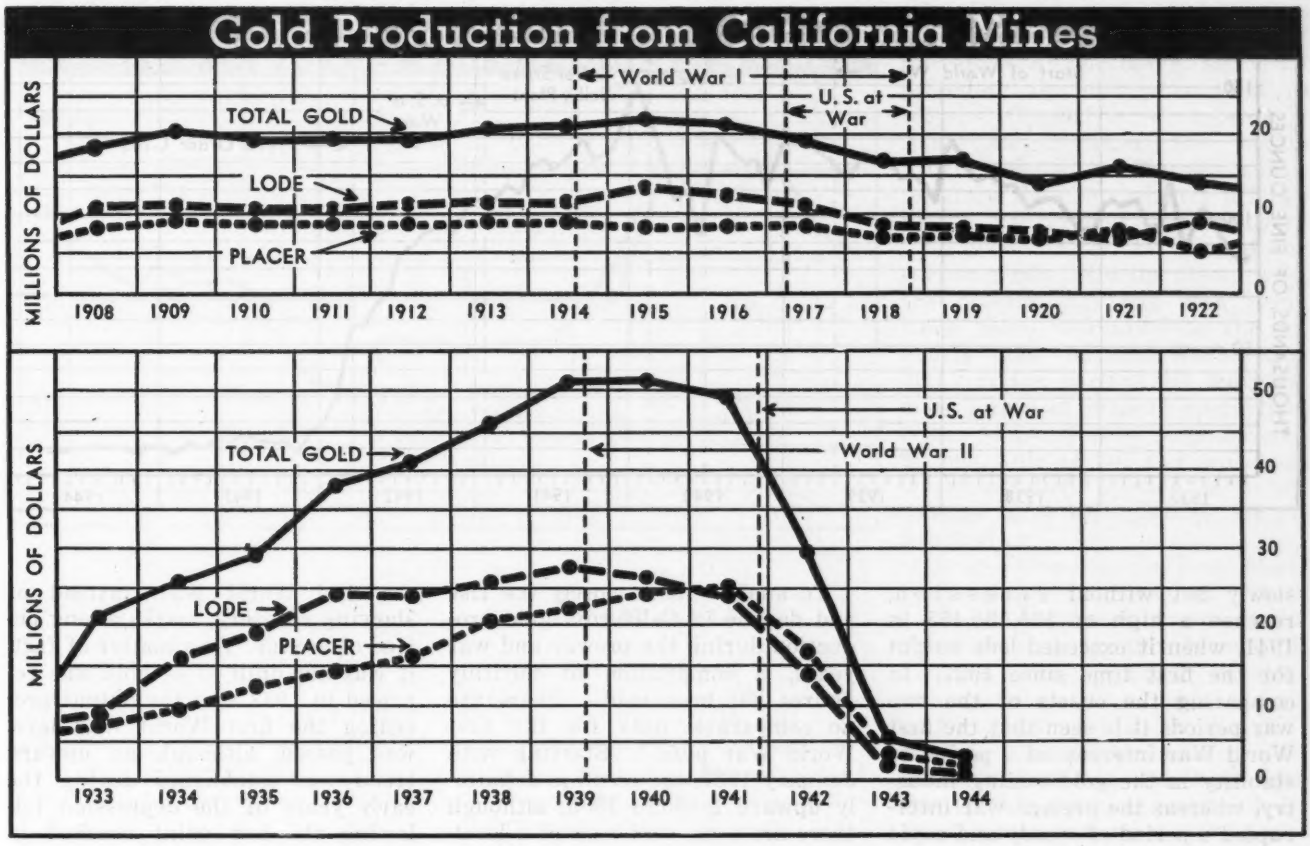
It is impossible to reach a simple conclusion as to the future of gold. The optimistic view that the removal of War Production Board Limitation Order L-208 will solve the problem does not seem at all justified. Long before the order went into effect the production decline had set in, and the order itself had little visible effect on the monthly production trend. Even the broader hope that peace, by removing the wartime restrictions on labor, supplies, equipment, capital, and management, will permit the industry to return to its 1939-40-41 vigor disregards the aftermath of war-high taxes, possibly inflated wage scales and supply costs, and the large capital requirements for reopening many properties.

On the other hand, a repricing of gold, if high enough, could mark a new era for domestic gold mining. The effectiveness of repricing obviously would depend on the new price, the special taxes if any, and the general postwar wage and price level.

### A Record Decline

An uninterrupted rise beginning in 1929 culminated in the production of $50,948,485 in California gold in 1940. Preliminary figures for 1944 show an output of $3,972,500, less than 8 percent of the production of only four years before. The decrease between 1941 and 1942 was $19,627,860, and between 1942 and 1943 was $24,488,415, both figures being greater than that between any other two consecutive years not excepting 1852-53, when flush placer production began to fail; 1883-84, when the Sawyer decision virtually ended large-scale hydraulic mining, or 1917-18, when the first World War and its accompanying inflation curtailed gold mining. Moreover, the record decrease established in 1943 will stand unchallenged at least until after

Published by permission of the Director, U. S. Bureau of Mines. Not subject to copyright.




California's gold industry can be rebuilt, because the present level of production is so low as to make impossible a further large decline.

Even at the higher price of $35 an ounce, the value of California's gold output in 1944 was well below that for any year since 1848. In quantity the State's output in 1944 was less than one-third that produced in 1929, the lowest year since 1848, when James W. Marshall made his historic discovery in the gravels of the American River near Coloma.

It is obvious, of course, that the decline is one of the results of the current war, but it is not so clear what conditions have been the principal causes. Higher wages, enlistment of miners in the armed forces, migration of miners to war industries, rising prices of supplies and equipment and difficulties in obtaining them, increased taxes, unfavorable priority and manpower rulings, and War Production Board Limitation Order L-208, were all causes of the precipitate decline in California gold production. To analyze the situation, data have been prepared which compare production for several years centering about each of the two wars. In addition, monthly production data covering the period since January 1937 have been prepared. Many of these are published here for the first time.

## Prewar Periods Unlike

An examination of the production data shows a different trend in gold production in the period preceding the first World War compared with the period preceding the present conflict. In the years before 1914, the production of both lode and placer gold was proceeding with little change from year to year. During the years preceding the current World War, however, total gold production in California was rising rapidly. Whereas the value of output in 1914 exceeded that of 1908 by 10 percent, the value of output in 1939 exceeded that of 1933 by 220 percent. The increases in the quantities of gold produced over the two seven-year periods were 10 and 134 percent, respectively, the latter figure being somewhat less than the increase in value because of the price rise in the 1933-39 period.

In the 1908-1914 period the gold industry was operating under relatively stable conditions free from major ore discoveries, fluctuations in the general price and wage levels, or the introduction of major inventions in mining or metallurgy affecting gold. During the first year of the 1933-1939 period, however, the price of gold, which had remained at $20.67 per fine ounce for over a half a century, commenced a rise which carried it to $35 per ounce by February 1934, where it remained. Literally thousands of mine examinations were undertaken by those who hoped to develop profitable operations based on the higher price for gold. The production record at California lode and placer mines during this seven-year period was one of great expansion. Among other causes of expansion was the introduction of the dragline dredge in 1933, production from which rose from $1,924 in 1933 to $6,038,165 in 1939.

In the 1908-1914 period the ratio between lode and placer production remained nearly constant, with the lode mines producing the larger quantities. During the 1933-1939 period, lode mine production reacted quickly to the stimulus of a higher gold price, but the upward trend was not sustained as long as in placer production. By 1936 lode output had reached $23,380,665 and remained near the $25,000,000 level through 1941, a period of six years. Placer output, which rose more

slowly but without recession, reached a high of $25,130,455 in 1941, when it exceeded lode output for the first time since 1927. In comparing the onsets of the two war periods it is seen that the first World War interrupted a period of stability in the gold mining industry, whereas the present war interrupted a period of steady and rapid expansion.

## Early Effects Similar

The course of gold production in the first three years of the second World War, 1939, 1940, and 1941, was extraordinarily similar to the first three years of the first World War, 1914, 1915, and 1916. In the United States both were periods of industrial maladjustment and readjustment during which much of the nation's energy was directed to the manufacture of arms both for defense and for the supply of belligerents who were to become allies. In these periods gold production at first rose and then succeeded remarkably well in holding its own.

With the declaration of war by the United States, both in 1917 and 1941, there was a decline in gold production. The entry into the second World War was catastrophic to gold production in California. In the first World War production for 1918 was below any previous year since 1903 but was only 26 percent below the 35-year (1884-1918) high, established in 1915. Outputs in both 1943 and 1944 were lower in quantity and value than for any other year since the discovery year 1848; the 1943 output was 90 percent below the high point reached in 1940, and preliminary figures indicate that 1944 was 92 percent below 1940.

To analyze more closely the rise and decline in California gold production during the prewar and war years, a compilation of monthly figures has been made. There are no comparable data for the first World War period. Starting with January 1937, the trend is definitely upward through 1939, although there are some evidences of a leveling off during 1939. In 1940 the record is somewhat confusing because a labor strike at the Selby lead smelter and gold-silver refinery delayed the receipt of large quantities of ores, concentrates, and placer gold which, though produced earlier in the year, were not reported in production statistics until the last months of 1940. The record for the year as a whole compared with the preceding one showed little change (3 percent greater). In correlating the production record with the course of the war it is found that the high point in monthly gold production, December 1940, was 12 months before Pearl Harbor but 16 months after the German invasion of Poland. A similar lag between the declaration of war in Europe in 1914 and its adverse effect on California's gold mining industry was also recorded.

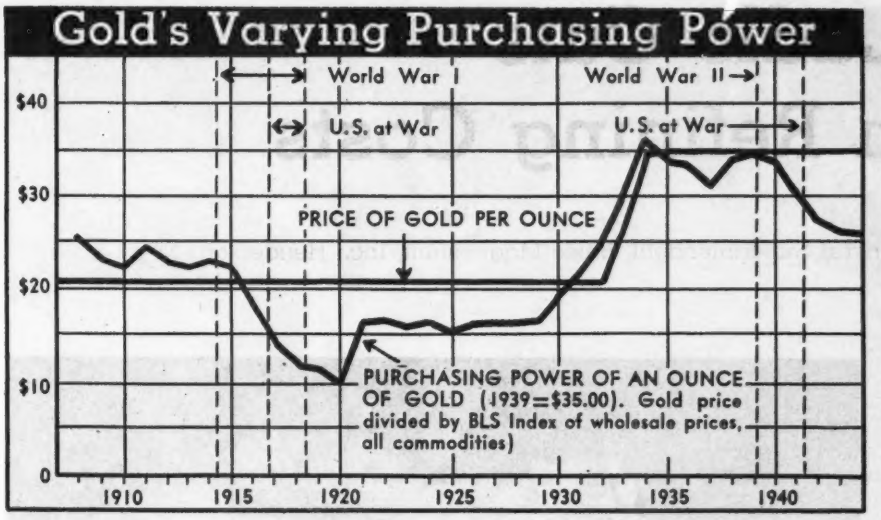
In 1941, however, the upward trend was reversed. Beginning with April 1941 a rapid decline set in and continued to June 1942, when the rate of decline became even steeper. It will surprise some to find that the curve does not alter its general pattern as a result of War Production Board Order L-208. By January 1943 gold production had sunk to the low level from which there has been no recovery.

The production record following the first World War, instead of showing recovery, marks a long period of decline. As a matter of fact, it was not until after gold was repriced in 1933 that the output preceding the first World War level was passed, although an upward trend was established during the early years of the depression following the low point reached in 1929.

## Purchasing Power Varies

In addition to using the production record as a guide to the gold-mining industry's reaction to war and peace, further light is thrown on the problem by considering the fluctuating purchasing power of the industry's product. The economic position of the gold-mining industry improves as the price of gold rises and as the cost of supplies and labor falls. To express in figures these economic variations from year to year a chart has been prepared to show the relative purchasing power of an ounce of gold by years from 1908 to 1944 inclusive. Each annual figure is determined by dividing the price of gold by the wholesale commodity index (U. S. Department of Labor) and then adjusting all figures to a common base, which in this instance was fixed arbitrarily to give an ounce of gold a purchasing power of $35 in 1939.

These data bring out some interesting information. In the period antedating the first World War the purchasing power of one ounce of gold fluctuated narrowly and averaged $23.63 for the period 1908-1914 inclusive. The first World War and its immediate aftermath caused the purchasing power of gold to fall precipitately until a low




point of $10.32 was touched in 1920. During the postwar years from 1921 to 1929 inclusive, gold mining did not share in the widespread prosperity, as the purchasing power of gold, which fluctuated very narrowly, averaged only $16.24 per ounce. During the depression years following 1929 and continuing until the beginning of the present World War, the gold miner's fortunes were at flood tide, with a falling commodity index and a rising price of gold. For the period preceding the second World War covering the years 1934 to 1939, the average purchasing power of an ounce of gold was $33.95. During the current war there has been an uninterrupted decline in gold's purchasing power, which in 1944 had sunk to $25.97, or only slightly above the level recorded in the period preceding the first World War, 30 and more years earlier.

Purchasing power of gold as presented here must not be taken as an exact reflection of the gold miner's state of well-being. The miner in all probability does not buy all the commodities on which the index number is based, or, if he does buy them all, he will not be likely to give them the same weight in his purchases that the statistician does in his computation of the index numbers. Moreover, as the years pass the miner probably finds the prices of some commodities less important in his expenses and those of other items more important, but the commodity index statistician varies his weightings based on other considerations. Nevertheless, the purchasing power of gold as calculated from wholesale commodity index numbers does represent an approximation of the *real* price of gold.

## Future a Puzzle

There are reasons for expecting a better recovery at placer mines than at lode mines after the present World War. The effects of idleness on mine workings ordinarily are much less serious at placer mines. The expected high wage scales after the war will bear less heavily on the placer operations, because labor usually makes up a smaller proportion of the costs than at lode mines. In addition, the relative importance of power in placer costs may not prove a handicap, because power costs have trended downward for years and should resist the inflationary effects of this World War better than wages and commodity prices. Much placer machinery is so highly specialized as to have remained idle during the war, awaiting resumption of gravel mining, whereas many lode properties have seen their power plants, hoists, mill machinery, and other equipment removed for service at strategic mineral properties. It should be noted, however, that few if any dragline excavators have remained at placer properties. As a whole it appears that the handicaps that face the lode mines substantially exceed the difficulties confronting the placer mines.

The charts show interesting parallelisms in the two World War periods. When used as bases for a guess as to gold production in California in the years immediately following this World War, the parallelisms offer both encouragement and discouragement. The gold industry entered the first World War with a stable production, whereas a boom had been in progress for a number of years preceding 1939. It seems safe to expect many of the forces which created the boom preceding the current conflict to reassert themselves when peace is reestablished. Thus the period which will follow this war seems to afford the gold industry a much better background for recovery than existed after the close of the earlier conflict. On the other hand, the present war has been many times more disruptive to the industry than the first World War. Many mines, particularly marginal ones, forced to suspend production, either by L-208 or by economic conditions, will not resume work unless the future is such as to encourage large expenditures for rehabilitation.

At the close of the first World War inflation had progressed with little governmental control to a point where a reaction became inevitable. The resulting deflation did not take place at once, and its major effect was felt in 1921. Office of Price Administration policies in this World War have been for strong inflation restraint by the federal government. If the rate of inflation throughout the war can be held to that experienced during the first three years, it seems probable that a sharp deflation comparable to that of 1921 will not occur. The net result could conceivably be a postwar price level roughly as unfavorable to miners with gold at $35 an ounce as was the 1921-1929 price level to gold miners with their product at $20.67 an ounce. Moreover, the industry faces the period following this war with most operations suspended.

## Price Is Key to Future

After the armistice of 1918 it was 15 years before gold in the United States was revalued to reflect the first World War inflation. If the postwar period price level is stabilized well above the average during the period 1935-40 and if gold remains at $35 per ounce, the outlook for the domestic gold miner will be gloomy indeed. Not only would the gold industry face an economic situation similar to that in the twenties, but it would enter the period with its mines largely idle and in disrepair; many operating companies would not have enough funds to finance resumption of production. A substantial rehabilitation of the industry seems to lie largely with the gold price higher than $35 per ounce, but this possibility cannot now be appraised with assurance.

# Insulated Ladle Cuts Magnesium Refining Costs

**H. G. SATTERTHWAITE,** General Superintendent, Basic Magnesium, Inc., Henderson, Nev.

WAYS AND MEANS OF CUTTING COSTS and increasing production were constantly sought during the period when Basic Magnesium, Inc., Henderson, Nev., operated under the direction of Anaconda Copper Mining Co. One of the most effective of such improvements was a new method of handling molten magnesium metal between the electrolytic cells and the refinery crucibles. Devised in the spring of 1944 the method saved considerable metal, manpower, and expense before the plant was shut down by WPB order in December 1944.

**OLD-TYPE, low-capacity car merely collected metal skimmed from electrolytic cells for transport to intermediate casting of magnesium pigs. Method wasted time and metal.**

## The Old Way

When the plant began operating, a little more than two years ago, the practice was to skim molten metal out of the electrolytic cells into ladles, cast it from these ladles into 60-lb. pigs, then carry these pigs to the refinery crucibles to be remelted, purified, and cast into the final ingots.

Skimming was done with a steel scoop of half-moon shape, 3½ in. wide, 5½ in. deep, and 11 in. long, with a handle of ⅝-in. steel rod 4 ft. 9 in. long. Skimmed metal was poured into an insulated ladle consisting of a brick-lined steel shell mounted on a four-wheeled frame with a single hitch at one end. Tires were solid rubber.

The ladle had spouts on either side, one leading down near the bottom to catch cell melt, the other opening at the top to drain off molten magnesium. The undecomposed $MgCl_2$ (cell melt), being heavier than the metal, sank to the bottom of the ladle if given time enough. Capacity of the ladle was 400 lb. of metal.

A Fordson tractor pulled full ladles to the outer runway of the building, where the ladle was tilted by a handwheel to pour metal into a row of steel kibbles shaped like a cheesecake. The chilled magnesium "cheeses" were then loaded on trailers and hauled over to the refinery to be melted.

One small shortcut was soon devised by bypassing the ladle and pouring the skimmed metal directly into the cheese molds. Some labor was saved, but the method allowed no time for cell melt to settle away from the magnesium. In skimming metal, it is impossible to avoid scooping up some cell melt, which ought to be returned directly to the cell. A further improvement was therefore sought.

## The New Way

Study of the problem eventually resulted in the method in use when the plant finally closed down. Metal was still skimmed by hand, but it was poured into a large insulated ladle, in which cell melt had ample opportunity to separate out. The ladle, carrying 4,600 lb. of metal (against 400 lb. for the old ladle), was then hauled directly to the refinery crucibles and the molten metal poured in. The saving in time, heat, and manpower is obvious.

The new ladle consisted of a ½-in. steel crucible reinforced with 2x½-in. ribs. This crucible was insulated from an outer 5/16-in. steel shell by Johns-Manville Superex. It was mounted on the chassis by a permanent hinge so that the ladle could be emptied by lifting the free side with a crane.

Over-all dimensions of this hot-metal car are 12x6½ ft. by 57 in. high. The chassis is equipped with 8-ply pneumatic truck tires and a trailer hitch for use on either end of the car. Molten metal can be left in the car for two or three hours without freezing.

Two men work on each side of the car, pouring skimmed metal into the door on each side. The men must face each other, and it is therefore necessary to have a left-handed and a right-handed metaller on each side of the car. Skimming is a matter of practice, though the attraction of the cathode for the scoop is always a nuisance. Spillage, which means metal burning, must be guarded against. One of the metallers sprinkles flux over the metal in the car to minimize burning.

After the full amount of metal has been ladled into the car, cell melt settles to the bottom. By

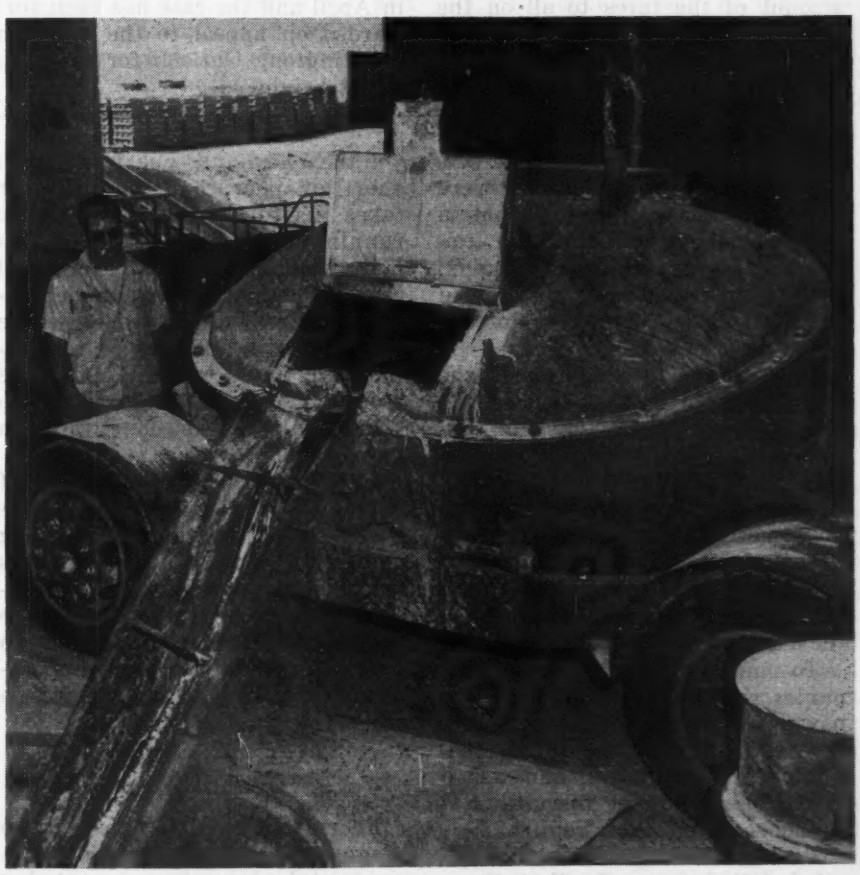
**SKIMMING METAL** into new-type insulated car, which holds ten times as much, handles more easily, carries molten metal direct to refinery crucibles.

means of an air lift through a metal pipe, this cell melt is then pumped back into a nearby cell. Weight of metal in the car is gaged by a chain that measures the liquid level.

The tractor driver covers the metal in the car with flux and then delivers it to the refinery over a concrete road built especially smooth to keep the metal from sloshing around and breaking the flux cover. Air is thus kept away from the molten metal.

At the refinery the car is weighed, then pulled up in front of one of the refining crucibles. A crane tilts the car and the molten magnesium flows through a metal launder into the crucible under a protective sprinkling of flux. The car is then reweighed for tare weight and is driven back to the electrolytic cell room for refilling. Cars in continuous service need no external heat, but could be heated with a torch if necessary.

During the time this system operated, a great deal of fuel was saved by not letting the metal chill to the solid state between electrolytic cell and refinery crucible. A better recovery was made because much less metal was burned to dross than formerly. Labor was saved because of the larger car capacity and elimination of the cheese casting and melting steps.



**MOLTEN MAGNESIUM**, direct from electrolytic cells, is poured into a refinery crucible from new-type car. Metal will not freeze unheated in car for two to three hours, though heat can be supplied from torch if required for longer storage periods.

# What Mining Men Are Doing About the Manpower Shortage

### New Park Bonus System Cuts Absenteeism

Absenteeism at New Park Mining Co., Keetley, Utah, had run as high as 18 percent (Jan., 1944) and bid fair to continue high until the management and representatives of Local 99 of the MMSW union worked out a bonus system based on rate of absenteeism that was put into effect Nov. 1, 1944. Avoidable absenteeism dropped immediately thereafter to an average of about 4.0 percent. Anyone considering a similar plan would do well to study the peculiar, and still unfolding, history of New Park's bonus system.

Most of the company's 230 employees live in Park City and Heber, far enough from the mine to require paying round-trip fares of 40c and 35c, respectively, to get to work. The bonus paid the amount of the fares to all on the payroll provided avoidable absenteeism in each pay period was held below 4.5 percent. Only once since it was offered has the bonus been lost.

But, good as it was, the plan struck a snag in March, when the Non-Ferrous Metals Commission turned it down on the ground that it violated the principles of wage stabilization. Chief objection was to the possible establishment of a precedent in the mining industry of giving workers "travel pay" to and from the job.

The decision was promptly followed by a one-day strike, which ended when workers, in a union meeting, voted to return to work. The union, the management, and local War Manpower Commission officials then joined in a petition to the Non-Ferrous Metals Commission for a rehearing of the case. The petition was denied late in April and the case has been forwarded on appeal to the WLB in Washington. Outlook for the plan is not bright.

IT WAS NO NEWS to *E.&M.J.* several months ago when we were informed in Washington that a critical manpower shortage impended in the metal-mining industry. We were, however, interested to know what Washington intended to do about it.

Our informant mentioned the U. S. Employment Service, the War Manpower Commission, Selective Service, the War Department, and a couple of other bureaus, all of which were going to do something drastic about manpower for mining. "Actually, though," said our friend, "the problem will be pretty much up to the companies themselves."

To find out what mining companies were doing about the manpower shortage, we wrote to representative companies in all sections of the country and asked them. The following discussion is condensed from their replies.

To begin with, no one who replied failed to agree that there was a manpower shortage, but there was a difference in severity. On the one hand, one mine is so short of men that the manager takes his turn from time to time running a loader or a motor in main haulage. On the other hand there is a mine at a summer resort on the shore of a lake, where there is little difficulty in recruiting men. (Note to the WMC: Does a mining company's proximity to a trout-filled lake constitute an unfair labor practice?)

But for the great number of mines lying within these extremes, the struggle to keep going has been bitter. Manpower has never been so short that a shutdown was forced; yet never have enough men been available to guarantee steady capacity operation. It has been a nightmare, to say the least.

## Use of Men

**Recruiting men.** If a man were to go up to a superintendent at any metal-mining company today and say, "How's rustlin'?" the superintendent, if indeed he remembered what those words meant, would probably faint. People don't ask for jobs these days; they accept positions. Here is what one manager had to say:

"We have increased our manpower 15 percent in the past three months, but at the expense of a terrific turnover, and by utilizing absolute dregs of humanity. These men were obtained by our own top personnel man from beer parlors and various dives in cities and not by sitting in USES offices waiting for workers to come in. So far it appears that we will get about 5 percent good men in this fashion, which we consider worth the trouble and expense."

Most mining companies have done a similar, if less energetic, job in looking for men. Radio, newspaper, and other forms of advertising have all been used, and appeals have been clothed in every sort of emotional and patriotic dress. The response, in general, has not been even as good as that reported in the previous paragraph.

The government, of course, controls all hiring through the USES, but no one who answered our inquiry said that this agency had furnished any significant number of men. As one manager expressed it, "I know that the local USES office and the local WMC are doing all they can to help us, but I am convinced that the lack of a unified national manpower policy prevents their getting tough and becoming really effective."

**Training Men.** Obtaining a man is only the beginning of the problem, for few men now available are skilled in anything useful to a mining company. Nearly all mining companies now have training programs of some kind, which is a good thing at any time. Anaconda Copper Mining Co.,[1] Utah Copper Co., U. S. Vanadium Co., Inspiration Consolidated Copper Co., and Miami Copper Co. are among those which have developed training methods, and there are many others. Most of these report that the War Manpower

[1] "How Anaconda Trains New Miners." Lester F. Bishop, *E. & M. J.*, Jan., 1944.

Commission's Training Within Industry program has been helpful.

**Working Conditions, Morale.** There are only two ways of getting a man to stay on the job: One way is to convince him that he will be shot if he leaves it. The other is to make him want to stay on the job of his own free will. In our old-fashioned way, we in this country are still struggling along with the second method—thank Heaven!

In this battle to keep men at work in the mines, ballyhoo has been far less effective than concrete inducements such as incentive wages, improved working conditions, better housing, and more facilities for recreation. This has been the experience of all the companies we consulted. Some refugee from a Hollywood press agent's office sweats out a phrase about "soldiers of the production front" and then relaxes, sure that he has solved the manpower shortage; but it takes more than words, however golden, to keep a man working hard in a hot stope.

The superintendent at a large copper mine reports that his company has an active labor-management committee, an effective incentive-wage system, and "a very efficient grievance procedure," which is incorporated in the union contract. He adds, "It is our belief that quick and fair adjustment of grievances keeps employees satisfied and at least somewhat more contented."

What this matter of keeping men working boils down to is that there are certain companies that men refer to as "a good outfit to tie to," and more and more organizations are studying ways of establishing themselves in that category.

## Use of Tools

Seldom, if ever, has there been a time in the mining industry when the use of labor-saving equipment has been investigated so thoroughly. Every company we talked to or heard from is interested in machines or methods that can save man-hours per ton mined or treated. One smelter reports saving nine man-days per month with a small mechanical shovel to load railroad cars, and also mentions installing a mechanical skull breaker to break up slag and matte shells for easier handling. The equivalent of six men was saved by the latter item.

## What Has Been Done About Absenteeism

| *Company* | *Absenteeism Rate, %* | *What the Company Did* |
|---|---|---|
| Utah Copper Co. | 5 | Maintained policy of promoting employees through ranks, provided occupational training opportunities, off-the-job recreation, help with transportation problems, showed government films on workers' part in war effort. |
| Bunker Hill & Sullivan M. & C. Co. | (2.5 avoidable) | Community cooperated by closing all public places except restaurants at midnight. These stayed open on Saturday night until 2 a.m., closed Sunday at 10 p.m. National curfew now closes all at midnight. |
| Eastern metal mine | 5 | Improved working conditions; segregation of men according to temperament, occupation, preferred living environment; good grievance procedure; display charts of comparative absentee records of departments. |
| A.S. & R., Garfield | 5.9 | Talked personally with every employee who was off without permission to impress him with need for steady work. Disciplined habitual absentees. |
| New Park Mining Co. | —4.5 | Bonus, if absentee rate below 4.5 percent, to all employees to cover travel cost between homes and mine. Not approved by N.M.C. as of April 15, 1945, but has been successful in cutting rate to less than 4.5 percent. |

Several mines report increased use of loaders, scrapers, and heavier locomotives, "to get by with fewer men." The behavior of unions in the building trades has been such as to lead one to expect unions to fight this trend toward maximum mechanization, but in general, unions in the mining industry have encouraged, or at least not hindered, it. This is fortunate, as the whole mining industry would suffer if short-sighted union policy should interfere with the growth of efficiency.

## Use of Women

Utah Copper Co.'s experience with women workers in recent years is typical of that of many other companies. We quote from Utah's communication:

"The new company policy to use women workers was adopted cautiously. At the mine women were first used as switch tenders; at the mills the first women employees did clean-up work, receiving the same pay as male employees. As the shortage of workers became acute, women were tried in other occupations, until now about 425 are employed. At the mills, women work in 22 classifications, and at the mine, in 16. Their work ranges from clerks to samplers, machinist's helpers, and operators in the fine-crushing and flotation departments. At the mine the list includes clerks, telephone operators, warehouse, carpenter, and electrical helpers, motor-car operators, and others.

"Rest rooms and other facilities were provided for women employees, and at the mills a female assistant employment director was engaged to handle administrative problems incident to employment of women. Operating officials praise the women's contribution, saying they have been able and willing workers."

Here is the experience of Bunker Hill & Sullivan, according to J. B. Haffner, general manager: "About 100 women are employed in our smelter, and they have in general been satisfactory. Work suitable for women is naturally somewhat limited, but the men have cooperated by vacating certain jobs suitable for women and accepting others that women could not fill. If the change was from a better to a lesser-paying job, it did not involve reduction in pay for the man voluntarily accepting such change. He retained his former rate of pay and his seniority rights."

Up in the Iron Country one company has used this past season

(*Continued on page* 160.)

# Lead-Zinc Flotation Problem Solved in Grinding Circuit

**JOHN B. HUTTL,** Associate Editor

AN UNUSUAL ORE demands that unusual milling schemes be devised to treat it economically. Such an ore is the one treated in the 600-ton Grandview flotation concentrator of American Zinc, Lead & Smelting Co. near Metaline Falls, Wash., where unusual methods have been successful in holding down grinding costs on a lead-zinc ore that appears quite formidable at first glance.

Conditions met in milling this ore, the product of the Grandview and the Metaline mines, were chiefly these: (1) the gangue is cherty dolomitic limestone, very tough, hard, and abrasive; (2) the lead mineral is generally massive, not intermixed with the zinc mineral, and is open to maximum recovery at the coarsest grind that can be sustained by the flotation machines; (3) part of the zinc mineral has crystallized in a blocky form and is released by a coarse grind, but much of it is finely disseminated and will yield only to extremely fine grinding. Out of these elements a most interesting flowsheet has been developed.

Because of separate ownership, ores from the two mines* are crushed, sampled, and weighed separately, and only then combined in the 400-ton storage bin shown in the accompanying flowsheet. Crushing plant capacity is about 60 tons per hour; the concentrator proper can handle 25 to 30 tons per hour of crushed material, depending on the hardness of the ore. Crushing plant equipment is shown in the flowsheet.

Care is taken in the fine crushing and grinding sections to avoid over-grinding the coarse lead and zinc minerals. Note the rolls in closed circuit with the screen, the undersize of which goes directly to the classifier of the grinding circuit instead of to the ball mill. This procedure is aimed at recovering finished material from the grind-

*See "Metaline Falls Area Grows as Zinc Producer." John B. Huttl. *Engineering and Mining Journal*, Vol. 146, March, 1945, p. 90.

**Table I. Screen Analysis of Classifier Overflow and Sand and of Ball Mill Discharge**

| | *Classifier Overflow, Percent Wt.* | *Classifier Sand (Entire Ball Mill Feed), Percent Wt.* | *Ball Mill Discharge, Percent Wt.* |
|---|---|---|---|
| +20 mesh | 0.77 | 56.0 | 15.2 |
| —20, +35 mesh | 9.40 | 13.1 | 21.3 |
| —35, +48 mesh | 9.45 | 4.5 | 9.4 |
| —48, +65 mesh | 9.63 | 3.4 | 7.3 |
| —65 mesh | 70.75 | 23.0 | 46.8 |
| | 100.00 | 100.0 | 100.0 |

**Table II. Screen Analysis, with Lead Assays, of Sand Screened Out of Classifier Overflow. Screen Used, 42-mesh Hum-mer**

| | *Percent Wt.* | *Accumulative, Percent* | *Lead Content, Percent* | *Percent of Total Lead in Product* |
|---|---|---|---|---|
| + 35 mesh | 85.60 | 85.60 | 0.04 | 68.00 |
| —35, + 48 mesh | 9.50 | 95.10 | 0.04 | 7.64 |
| —48, + 65 mesh | 3.30 | 98.40 | 0.07 | 4.69 |
| —65, + 80 mesh | 0.45 | 98.85 | 0.15 | 1.35 |
| —80, +100 mesh | 0.30 | 99.15 | 0.10 | 0.60 |
| —100 mesh | 0.85 | 100.00 | 1.15 | 19.55 |

**Table III. Reagent Consumption and Assays of Products of Lead and Zinc Flotation Circuits**

| *Reagent* | *Quantity* | *Product* | *Assay, Percent* | |
|---|---|---|---|---|
| *Lead Circuit* | *Lb./Ton* | | *Lead* | *Zinc* |
| Zinc sulphate | 0.55 | Lead concentrate | 75.0 | —2.0 |
| Aerofloat 31 | 0.10 | Zinc concentrate | —1.0 | 60.0 |
| B-23 frother | 0.08 | Final tailing | 0.07 | 0.30 |
| *Zinc Circuit* | | | | |
| Copper sulphate | 1.15 | Recovery of lead in lead concentrate, 93 to 95 percent. | | |
| Xanthate, Z-3 | 0.16 | Recovery of zinc in zinc concentrate, 92 to 93 percent. | | |
| Pine oil | 0.10 | | | |

ing circuit as quickly as possible. Separation in the classifier is made at about 35 mesh, and there is enough minus-35 mesh material in the grinding circuit feed to make it advisable to put it directly into the classifier.

Grinding units are described in the flowsheet, and screen analyses of classifier overflow and sand and of ball mill discharge are given in Table I.

Because the lead mineral grinds so readily, little lead is left in the coarse fractions of the classifier overflow. This makes it possible to screen the overflow on 42 mesh, send the undersize to lead flotation, and pass the oversize directly on to the regrind mill in the zinc department. In this way maximum tonnage is ground in the primary mill (Marcy 86) because of the coarse overflow maintained in the classifier, and sliming of lead is thus held to a minimum, yet the lead flotation cells are relieved of the difficulty of handling the coarsest sand in the classifier overflow. A screen analysis, with lead content of each product, given in Table II, shows the nature of the material (3 to 5 tons per hour) screened out of the overflow.

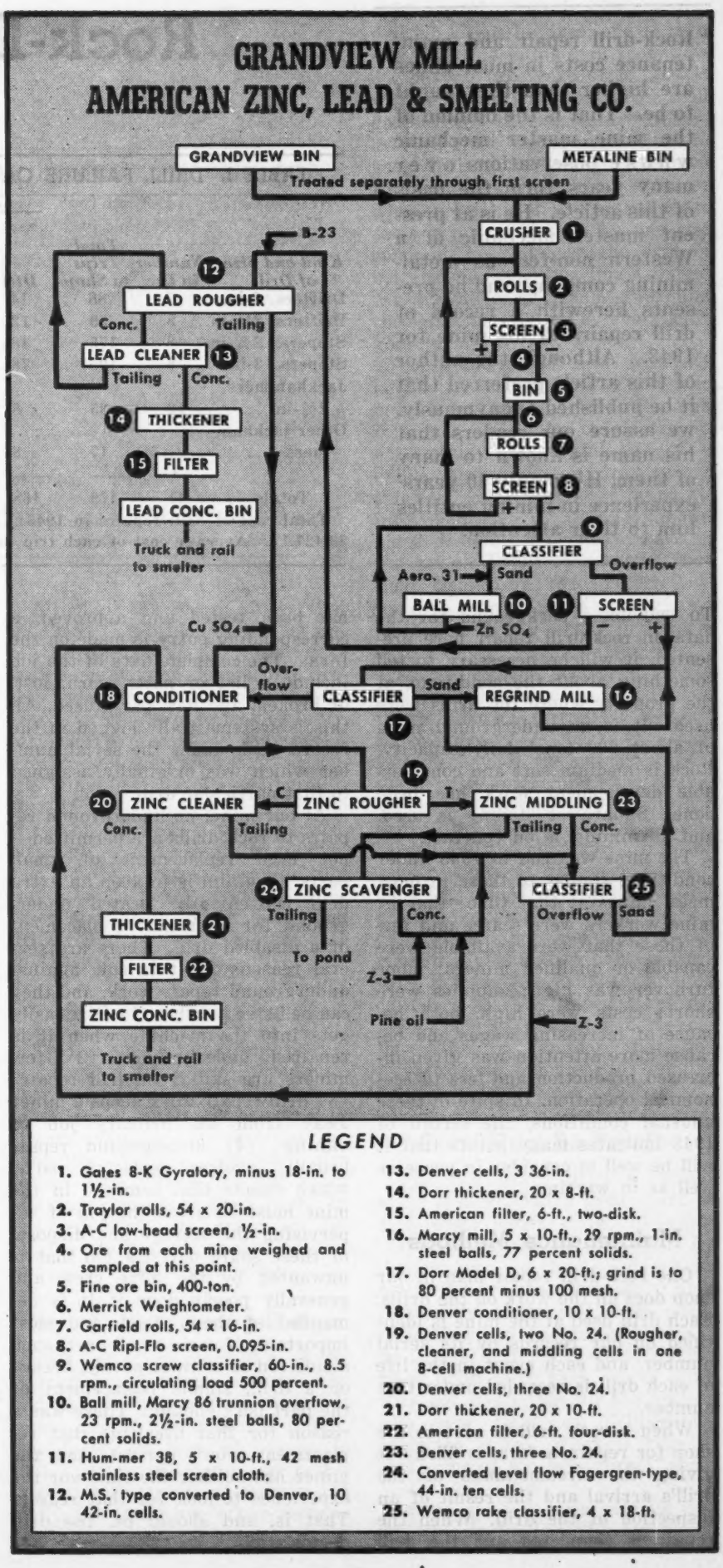
## Zinc Mids Reground

Lead flotation is straightforward thereafter, as indicated in the flowsheet. Lead rougher tailing goes to the zinc conditioner, then into the zinc flotation circuit, which is operated so that the coarse zinc and any fine free zinc have a chance to come out as clean concentrate in the head end of the circuit.

A considerable part of the zinc mineral in the feed will develop a high-grade concentrate at about 65 mesh; the remainder will not develop a good concentrate until it is ground to nearly 150 or 200 mesh. Therefore, the zinc middlings and cleaner tailing, together with the original oversize from the primary classifier overflow, are put through the regrind circuit, where they are ground to about 80 percent minus-100 mesh. The ground product then joins the lead rougher tailing in the zinc conditioner.

Reagents used in the lead and the zinc circuits and assays of the products are given in Table III.

Operations at the Grandview concentrator are directed by Homer P. March, mill superintendent, to whom thanks are due for the information presented here.




### LEGEND

1. Gates 8-K Gyratory, minus 18-in. to 1½-in.
2. Traylor rolls, 54 x 20-in.
3. A-C low-head screen, ½-in.
4. Ore from each mine weighed and sampled at this point.
5. Fine ore bin, 400-ton.
6. Merrick Weightometer.
7. Garfield rolls, 54 x 16-in.
8. A-C Ripl-Flo screen, 0.095-in.
9. Wemco screw classifier, 60-in., 8.5 rpm., circulating load 500 percent.
10. Ball mill, Marcy 86 trunnion overflow, 23 rpm., 2½-in. steel balls, 80 percent solids.
11. Hum-mer 38, 5 x 10-ft., 42 mesh stainless steel screen cloth.
12. M.S. type converted to Denver, 10 42-in. cells.
13. Denver cells, 3 36-in.
14. Dorr thickener, 20 x 8-ft.
15. American filter, 6-ft., two-disk.
16. Marcy mill, 5 x 10-ft., 29 rpm., 1-in. steel balls, 77 percent solids.
17. Dorr Model D, 6 x 20-ft.; grind is to 80 percent minus 100 mesh.
18. Denver conditioner, 10 x 10-ft.
19. Denver cells, two No. 24. (Rougher, cleaner, and middling cells in one 8-cell machine.)
20. Denver cells, three No. 24.
21. Dorr thickener, 20 x 10-ft.
22. American filter, 6-ft. four-disk.
23. Denver cells, three No. 24.
24. Converted level flow Fagergren-type, 44-in. ten cells.
25. Wemco rake classifier, 4 x 18-ft.

# Rock-Drill Repairs

**Rock-drill repair and maintenance costs in most mines are higher than they ought to be. That is the opinion of the mine master mechanic whose observations over many years form the basis of this article. He is at present master mechanic of a Western non-ferrous metal-mining company, and he presents herewith a record of drill repairs at his mine for 1943. Although the author of this article preferred that it be published anonymously, we assure our readers that his name is known to many of them. His nearly 40 years' experience in mining entitles him to their attention.**

**TABLE I. DRILL FAILURE CAUSES AND COST OF REPAIRS.**

| Kind and Size of Drill | Number in Use | Total Trips to Shop | Failure Causes: Dirt | Lack of Oil | External Parts Lost or Broken | Cost of Such Parts, Dollars | Total Cost of All New Parts, Dollars |
|---|---|---|---|---|---|---|---|
| Drifters, 3-in. .. | 7 | 88 | 14 | 28 | 10 | 23.45 | 753.00 |
| Drifters, 3½-in.. | 8 | 59 | 12 | 17 | 7 | 14.05 | 352.40 |
| Stopers, 2¾-in.. | 8 | 175 | 48 | 55 | 18 | 107.10 | 970.30 |
| Stopers, 3-in.... | 6 | 105 | 78 | 45 | 7 | 39.85 | 190.10 |
| Jackhammers, 2⅝-in. ..... | 12 | 35 | 8 | 5 | 4 | 18.00 | 135.20 |
| Other jackhammers ..... | .. | 17 | 8 | 5 | .. | .... | 20.40 |
| Totals ..... | 41 | 479 | 168 | 155 | 46 | 202.45 | 2421.40 |

**Total cost of drill repairs in 1943: Labor, $1,005.77; parts, $2,421.40; total, $3,427.17. Average cost of each trip to shop, $7.15.**

TO PROVIDE a background for the data on rock-drill repair here presented, it will be necessary to tell something about the conditions at the property where the drills were used. It is an underground mine of about 200 tons' daily capacity. Rock is medium soft and considerable development work has been done. Square-set stoping is used, and all mining is on contract.

The mine was run in 1943 under conditions similar to those in most metal mines at that time; that is, mine workers were scarce and few of those that were available were capable or qualified miners; labor turnover was high; supplies were short; costs were high, both because of increasing wages and because more attention was given increased production and less to economical operation. In spite of these unusual conditions, the record of 1943 indicates many points that it will be well to consider in peace as well as in wartime.

## Maintenance Methods

One rock-drill repair man in our shop does all the work on the drills. Each drill used at the mine is identified on our records by its serial number, and each event in the life of each drill is recorded under that number.

When a rock drill is sent to the shop for repair, a form is filled out giving the circumstances of the drill's arrival and the result of an inspection of the drill. When the repair is completed and the drill has been tested and approved, a corresponding entry is made on the form. The complete data of the job include a list of parts worn, lost, or broken, and new parts used. All this is systematically logged in the record book under the serial number which was originally assigned to that particular drill.

At our mine, no underground repairs to rock drills are permitted—not even replacement of small parts. The aim is to keep an extra drill conveniently located underground for immediate replacement of a disabled drill. There are several reasons for this rule against underground repair work, and they can be listed briefly: (1) Dirt easily gets into the machine when it is repaired underground; (2) few miners are skilled in drill repair; (3) drill repair work keeps a miner away from his primary job of mining; (4) underground repair usually involves replacing parts, which means that someone in the mine must be given the job of supervising the storage and disposal of these spare parts, a job that is unwanted by the mine crew and generally poorly done if it is demanded of them. Last, and most important, if some small part, such a side rod or a water needle, breaks on a drill, simple replacement of the part isn't enough. There was a reason for that breakage that replacement won't correct, and the miner has neither the time nor the experience to look for that reason. That is, and should be, the drill doctor's job.

The accompanying tables show the drills used at our mine in 1943, the number of times each was repaired, the cause of trouble in most cases, the total cost, and the cost per trip. These costs, it must be remembered, include only labor and replacement parts used in drill repair. No overhead or other charges were considered, although it is evident that other costs, such as time lost in the mine, handling costs in the mine, and shortened life of drills, are also involved.

It must also be understood that these costs are abnormally high for several reasons. In the first place, the demand for metal was so great in 1943 that no one cared how many drills were broken up so long as ore was broken out. Second, there does not seem to exist on the part of either management or labor the old-time desire to get the most out of a machine at the lowest cost. Things that were once recognized as carelessness on a miner's part are now often put down as the machine's fault, and forgotten.

An example of the good results that can be obtained by taking care of equipment is furnished by the leasing system of mining once practiced at Cripple Creek, Colo. There the miners bought their own drills and also paid for drill repair parts and maintenance. The result was that drill-repair costs at Cripple Creek were about a tenth of those given with this article.

The final factor in raising costs is the shortage both of skilled miners and skilled maintenance

# Can Be Reduced

**TABLE II. REPAIR FREQUENCY AS INFLUENCED BY DRILL AGE.**

| *Kind and Size of Drill* | *Number in Use* | *When Purchased* | *Total Trips to Shop 1943* | *Average Trips per Drill* |
|---|---|---|---|---|
| Drifter, 3-in. ..... | 4 | 1939 | 49 | 12.25 |
| Drifter, 3-in. ..... | 1 | 1940 | 10 | 10.0 |
| Drifter, 3-in. ..... | 2 | 1942 | 4 | 2.0 |
| Drifter, 3½-in. ... | 6 | 1939 | 56 | 9.5 |
| Drifter, 3½-in. ... | 1 | 1942 | 3 | 3.0 |
| Drifter, 3½-in. ... | 1 | 1943 | 0 | 0.0 |
| Stoper, 2¾-in. .... | 6 | 1939 | 158 | 26.3 |
| Stoper, 2¾-in. .... | 2 | 1941 | 17 | 8.5 |
| Stoper, 3-in. ..... | 6 | 1942*a* | 105 | 17.5 |

*a*These were rebuilt machines when purchased in 1942. They were disliked by the men because they were too large and heavy for our ground. As a result, the 2¾-in. machines did about 80 per cent of the work.

men. Of the two groups, the latter is the rarer. Good drill-repair men are extremely hard to find, and few good ones are being produced, for experience is the only worthwhile teacher on that job.

## Stopers Mistreated

Note in Table II the high frequency with which stoper drills were sent up for repair. These machines were simply handled more roughly than other types of drill, probably because they are heavier and more awkward and the men have an instinctive dislike for them. Of the 479 repair jobs in 1943, 168 were caused by dirt in the machine, and of these 126, or 78 percent, were stopers. Of the 155 jobs involving dry machines, 100, or 64.5 percent, were stopers, which is clearly a matter of special neglect.

## Dirt in the Machine

Because rock drills are built to tolerances as fine as those of a good watch, it is essential that dirt be kept out of the drill. Yet few miners seem to understand the importance of this point. Most troubles with dirt in drills are caused by failure to blow out the air hose before attaching it to the drill; by lack of care in transporting the drill; and by leaving the drill exposed to a blast. One-third of the drill repairs in 1943 were due to dirt in the drills, and many of these could have been avoided by proper care of the machines.

Although the record shows that in 1943, 155 drills, or 32 percent of the total, arrived in the shop with some part of the machine dry, this by no means indicates the extent of trouble due to lack of lubrication. The reason is that whenever a drill sticks for any reason, the miner usually oils it liberally; then if that drill has to be sent to the shop anyway, it arrives oiled, although it may belong by right in the "dry" column. It is certain that faulty lubrication is responsible for most rock-drill repair jobs, and drill manufacturers can help cure this situation.

## Broken or Lost Parts

This item refers to external breakage of drill parts by carelessness in handling the drill; that is, in setting it up or transporting it. Broken handles and throttles are examples of this. The item also covers little things like lost plugs and nuts and other small parts. In 1943, $202.45 was spent on replacing small parts broken or lost in just such avoidable ways.

## New Drills Treated Better

Table II gives some idea of the relationship between age of drill and the frequency with which it comes out of the mine for repair. One factor in this, of course, is that a new drill stands up better under rough treatment than an old drill; but there are other reasons for better results with newer drills.

If a good miner is given a new drill of a type he likes, and is then told that this is his drill from now on, he will take care of it, and it will be a long time before the drill doctor sees that machine. Wherever possible, therefore, we try to keep drills going back to the men who know and like them. A miner who knows his drill can get more footage out of it than anyone else can, and he will keep the drill in better condition. Just like a rented car, a drill that circulates around the mine, being used by everybody, goes to pieces fast.

The point is that new drills get better treatment from the men who use them than do old drills, and this fact should be considered in determining the useful life of a drill.[1] A drill doctor can also use this fact to his advantage by painting, or otherwise shining up, an old drill before he sends it back to the mine. Experience shows that such "cleaned-up" drills receive better care than do drills equally good mechanically but shabby in appearance.

Our experience has been that a rock drill should be discarded when the cylinder has worn 0.003 to 0.004 in. oversize. This checks the experience related in the article referred to in the preceding paragraph. When the cylinder has worn that badly, the machine should be discarded and the good parts used for repair work. It has been our experience, also, that chrome plating of cylinders and valves plus the use of new parts does not make a new machine. This plating helps in wartime, but we have found that plated cylinders soon developed other defects, such as cracks, and we believe that a cylinder that has worked long enough to require plating had better be retired.

## Care Must Be Taught

The cost figures given in Table I make it clear that a great part of drill-repair costs could be eliminated by proper care of drills by the men who use them. This means nothing more than keeping a drill reasonably clean and well oiled, something that any miner can do if he thinks of it. The fact that so many drills come back dry or dirty does not mean that all the miners who sent them up deliberately neglected them. What is true is that some of the men forgot, some

[1] "When Should a Rock Drill Be Dismantled?" F. M. Waterland, E.&M.J., p. 70, Sept., 1943.

were lazy, and some didn't know any better. Remember, this does not concern the majority of miners, who are good, careful workers.

What can be done with the miners who don't know or don't care? The only solution is to teach miners better methods of rock-drill care through their supervisors, the foremen and shift bosses. These men have to do the job, if anyone does, of seeing to it that their men not only know how to handle rock drills but actually handle them that way.

To aid supervisors in this work, the master mechanic should arrange to furnish them with cost records and histories of all drill-repair jobs for which each supervisor's men are responsible. Causes of breakage and repair costs should be given and from them the supervisor can tell exactly where to devote most of his effort toward cutting these costs. Don't forget that the supervisor's prime interest isn't just cutting repair costs. It is likely that if repair costs are high, mining costs are, too, and efforts to cut one will have a good effect on the other. If some miner's drill gets dirty and sticks, and, after a period of wrestling with it, he winds up by beating it with a wrench, he has not only run up a nice repair bill, he has also boosted mining costs with his lost time and his drill handling charges.

## Good Tools for Good Men

Mine management can help in lowering drill-repair costs and in increasing production by being careful to keep drilling equipment up to par in every respect. No man, however capable he may be, can do his best work with inferior or shoddy tools. It is worse than useless to hand good men old, worn equipment, then complain that they are lying down on the job when they don't get out a decent production. In such a situation it is the management which lies down on the job, not the man. Incidentally, if anyone is curious about it, I am not referring to the management of my own company.

In connection with keeping drills in good condition, our experience has been that replacement parts should be purchased only from the maker of the drill. He knows what his drill is designed for, and he knows what each part can, and must, stand. The first cost of "outside" parts may be less, but we have found that in our drills, at least, the shorter life of these parts wiped out the first cost differential.

## Make Records Complete

The drill-repair shop should have as complete records as possible of every drill the company owns. These records should include everything that has happened to the drill from the date of its purchase. It is probably asking too much, but this record should show who has used the drill at all times. When the drill must be sent to the repair shop, the miner or his supervisor should put a tag on it telling where the drill was used, who was using it, and what has happened to it.

The most important job the drill-repair man has is to inspect each drill, when it comes into the shop, for the purpose of changing parts that might cause breakage if they were left to continue operating. If a breakage has occurred, the drill doctor ought to determine its cause so that the fault can be corrected. In this connection, it should be mentioned that the design of modern rock drills is seldom at fault. In his search for the cause of breakages, in up-to-date drills, the mechanic generally will have to look beyond the design of the machine.

## Word to Manufacturers

Having brought manufacturers into this, I would like to go on to suggest one or two ways in which our experience indicates that rock drills might be improved. Modern rock drills are such beautifully effective precision instruments that little fault can be found with them; yet in the matter of lubrication I believe there is still work to be done.

It has never seemed to me that the lubrication of the front head of any drill is satisfactory. With the exception of the line oiler, not much has been done recently to make lubrication easier or more positive. I really think it is marvelous that rock drills operate as well as they do, for it would be hard to find a modern machine that depends so much on lubrication yet is so hard to lubricate as a rock drill.

Even the line oiler is not altogether satisfactory, because I am sure much of the dirt entering a drill comes right from the oiler. This auxiliary is located 10 to 50 ft. away from the drill, often in a wet, dirty place, and few miners take the trouble necessary to keep the oiler entirely free of dirt.

To check on the quantity of oil in a line oiler, a miner has to leave the face, climb down or walk back to the air valve, shut it off, go back to check the line oiler, return to the air valve, then go back to work. Too many miners, instead of doing all this, just run the drill until it sticks, which they take as an indication that the machine needs oil. Of course, it isn't right, but a lot of them do it that way.

Why couldn't the line oiler and the machine oil reservoir be incorporated into one positive oiler built into the machine? Such an oiler should have capacity enough for a shift's work and the line oiler could be eliminated entirely. The miner would have to lubricate only one convenient place instead of two widely separated spots as is necessary with types of equipment used at present.

Another suggestion is that some method be devised to permit a screen to be set into the air line to keep dirt out of the drill. Such screens have been installed in the past at the gooseneck or elsewhere, but as soon as they became fouled, or even sooner, the miner simply poked a hole in the screen, and the damage was done.

The combination of the built-in oiler and the screen would do much to eliminate the troubles we have with dry and dirty drills. It seems to me that any slight extra weight in the drill made necessary by such built-in parts would be far offset by the added convenience and the decreased cost of operation and repair.

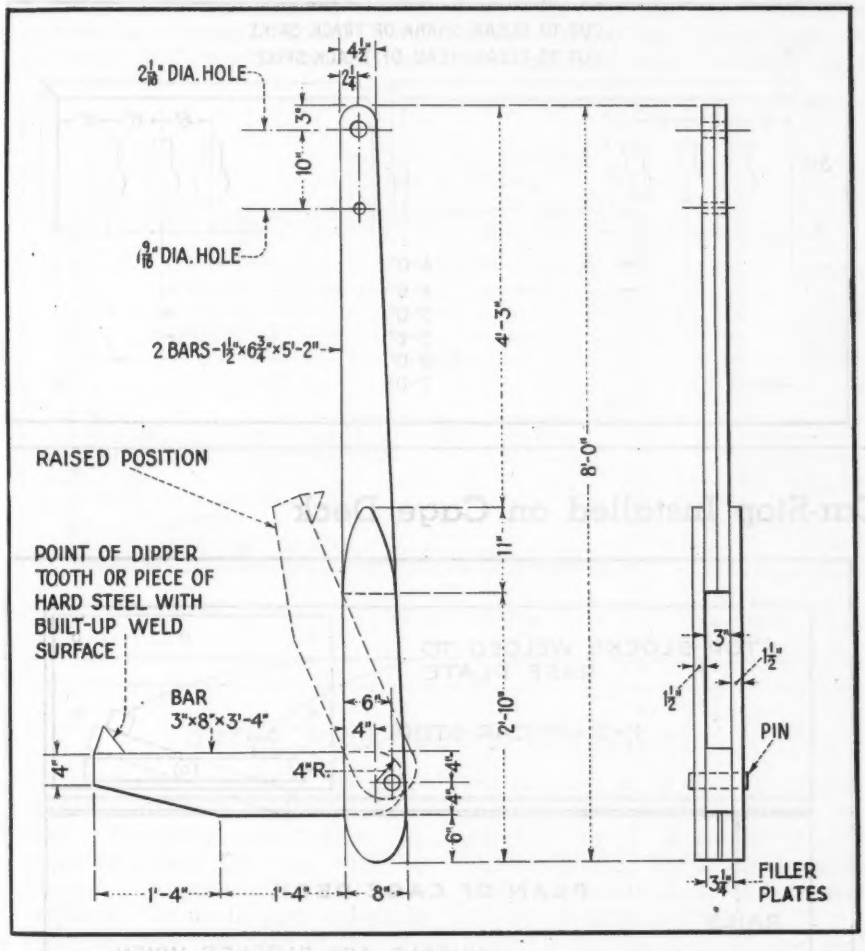
## Attitude Is Important

In closing, I would like to add one thought that to me seems extremely important. That is the effect on the miners themselves of attempts to cut drill repair costs in the manner I have outlined. If loose, sloppy, careless treatment of drills is tolerated in a mine, the entire operation is likely to fall into a similar rut. The men begin to think, "Well, if the boss doesn't care, I sure don't."

But if the men see that good clean work and use of proper methods are appreciated and rewarded by the management, they are likely to want to learn and to use those methods. The primary purpose of all such work should be to build up a man's pride in a job well done, for there is no incentive, after all, that can compare with a man's own desire to better himself and his position.

# OPERATING IDEAS

## Hinged Hook Clears Jammed Gyratory Crusher




"ANYONE who has observed a crusher man wrestling a huge hook of rigid design through too small an opening in a jammed gyratory crusher will appreciate the happy thought of this hinged hook"—thus writes Philip A. Schwab, civil engineer, Knoxville, Tenn., who submits the design here illustrated.

With the tip in the raised position, the hook may be lowered easily through a small opening. When the hook is hoisted, the tip automatically drops and engages the rock to be dislodged from the crusher.

Two 1½x6¾-in. bars are welded together to form the upper part of the hook. The hinged portion is constructed of a 3x8-in. bar and is suspended from a yolk consisting of two 1½x8-in. bars separated by filler plates, which also serve as a stop to prevent the hinged portion from dropping too far. The hinge pin is 2 in. in diameter. A dipper tooth or a piece of steel with a built-up welded surface is welded to the tip of the hook to resist wear.

The hook was developed for use at the primary 42-in. gyratory crushers at TVA's Fontana Dam quarry, where it proved to be a time saver.

## Simple Alteration Permits Continuous Filter Operation

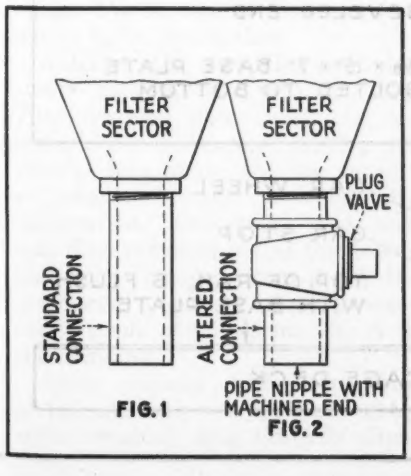



FIG. 1 FIG. 2

OPERATORS of the concentrator of the United States Smelting, Refining and Mining Co. at Bayard, N. M., were faced with a filtering problem when the plant flowsheet was changed to produce a lead and a zinc concentrate instead of the former combined lead-zinc concentrate.

Rather than put in a new filter, two spare disks on the installed filter were operated intermittently to handle the relatively small quantity of lead concentrates, and the remaining disks were operated continuously to filter the zinc concentrates. This necessitated cutting the lead portion of the filter in and out without interfering with the continuous filtering of the zinc concentrates.

This problem was solved by altering the standard filter sector connections shown in Fig. 1. Each filter sector was fitted with a 1-in. plug-valve and a machined pipe nipple as shown in Fig. 2. By closing these valves on the disks handling lead, the remaining disks handling zinc could operate continuously without loss of vacuum, air pressure, or operating time.

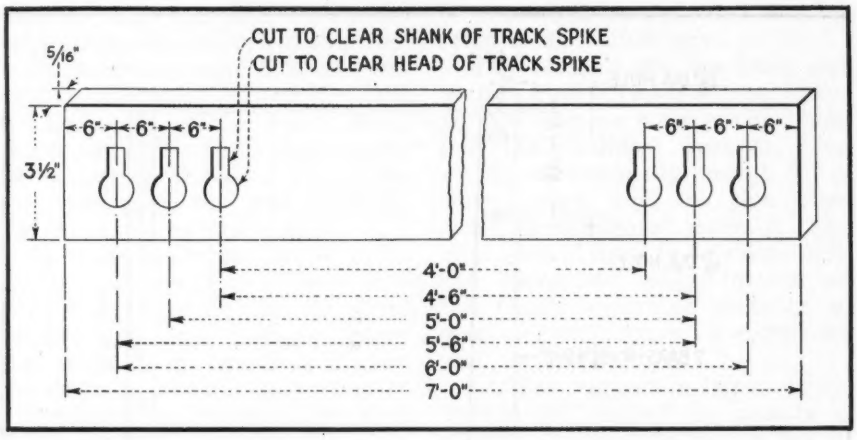
## Metal Lash Plank Aids Timber Installations

THE LASH PLANK here presented was designed by M. R. Evans, manager of the Montana Coal & Iron Co., Washoe, Mont., for the following purposes: To hold timber legs or posts securely while collar or girts are installed. To serve as an accurate spacer between adjacent posts or legs. To form a staging used to raise timbers into place. To eliminate the use of nails which usually protrude from the posts when other methods are employed.

To attach the lash planks track spikes are driven into adjacent posts or legs at a height convenient for a staging. The lash planks are then slipped over the spikes by means of the slotted holes shown in the drawing. Where complete sets are installed two lash planks are used one on each side of the drift or entry. Mr. Evans states that the planks are rigid enough when installed to employ them as a staging for collars as large as 16 in. in diameter and 19 ft. long.

The lash plank is removed from the posts by bumping it up slightly to clear the heads of the track spikes driven into the posts or legs.

The slotted holes are cut on 6-in. centers as shown in the accompanying drawing. By this arrangement, the plank can be used to set legs at standard intervals varying from 4 ft. to 6 ft. at 6-in. increments.

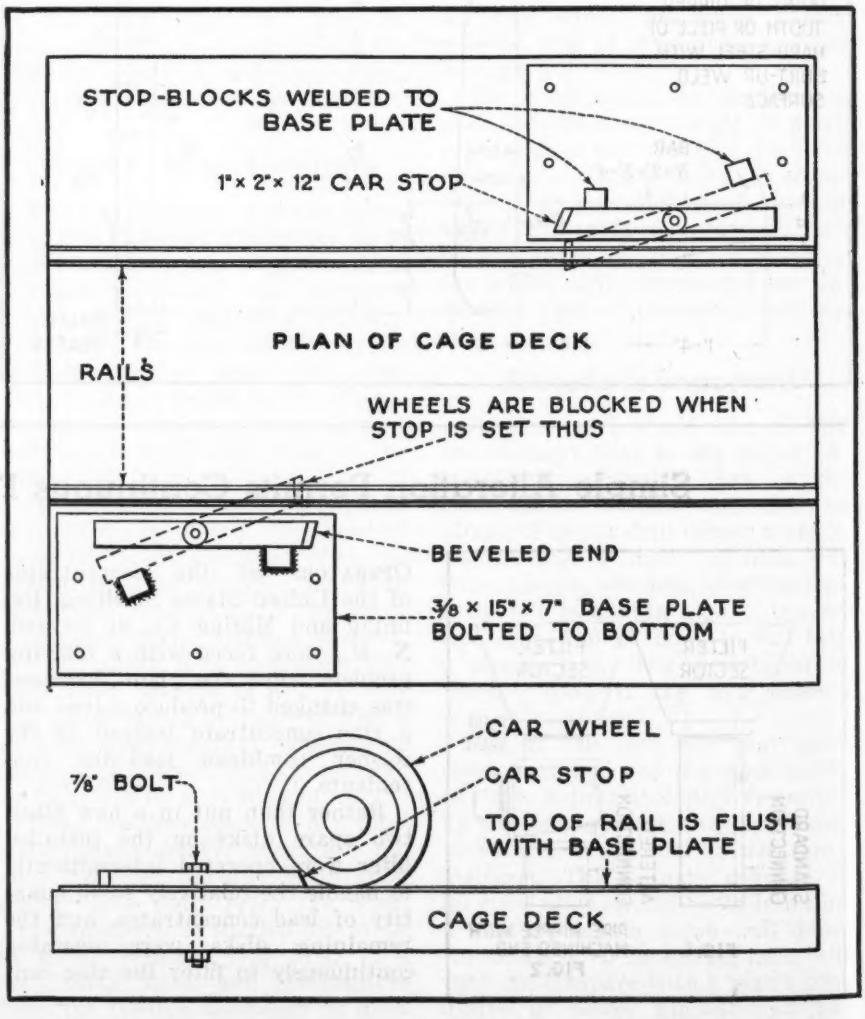



## Safety Car-Stop Installed on Cage Deck

ORE IS CAGED to the surface in 20-cu.ft. cars in the single hoisting compartment of the shaft of the Chromite Limited property, St. Cyr, Quebec, Canada. Chain chairs are used on the top level and each hoisting level. Noting that the heavily loaded cars were bending conventional drop-bars installed on either side of the cages, to prevent movement of the cars while being hoisted, Paul Stiernotte, master mechanic, designed and installed an improved car-stop on the cage deck, as shown in the accompanying illustration.

Bars of 1x2x12-in. steel are attached to the cage deck with ⅞-in. bolts and may be rotated to block diagonally opposite wheels of a mine car and thus arrest forward and backward motion. Three-eighth-in. steel plates mounted flush with the tops of the deck rails permit the stops to slide freely into position. Short steel stop-blocks are fillet-welded to the plates to hold the car-stops in either the blocking or non-blocking position as indicated in the drawing.

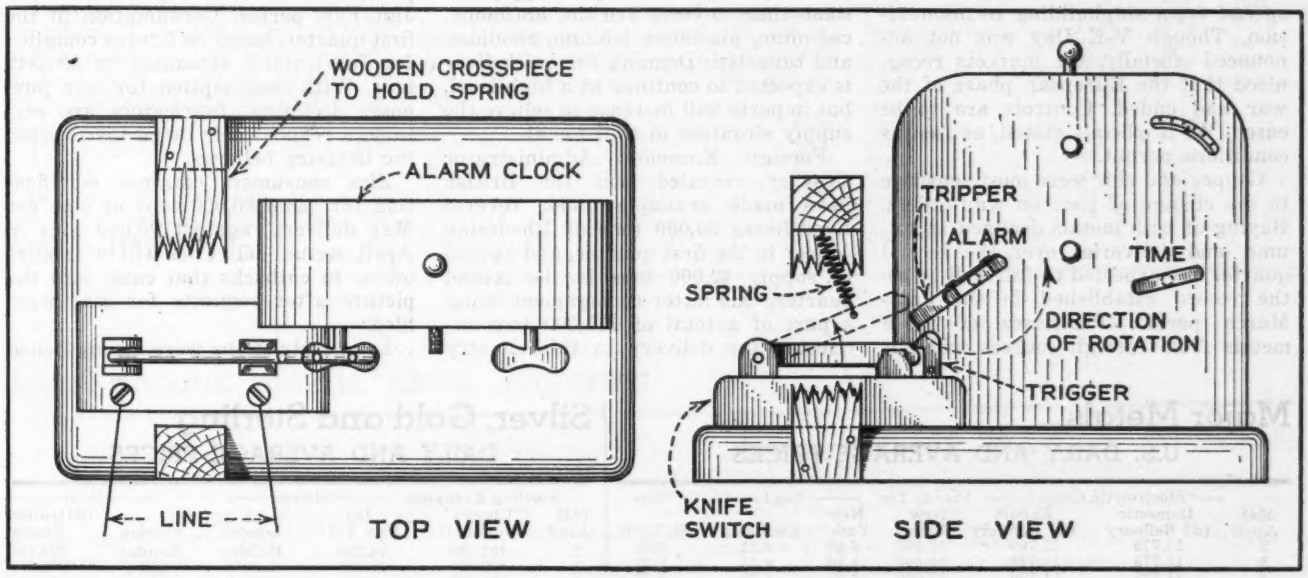
Cyril L. Jerrom mine manager, writes that the improved stop "is safe, strong, positive, and easy to operate. Our cagers like it, and we have found that it has been a means of increasing our total tonnage hoisted per shift."


STOP-BLOCKS WELDED TO BASE PLATE
1" x 2" x 12" CAR STOP
PLAN OF CAGE DECK
RAILS
WHEELS ARE BLOCKED WHEN STOP IS SET THUS
BEVELED END
⅜ x 15" x 7" BASE PLATE BOLTED TO BOTTOM
CAR WHEEL
CAR STOP
⅞" BOLT
TOP OF RAIL IS FLUSH WITH BASE PLATE
CAGE DECK

## Alarm Clock Switch Controls Laboratory Tests

ALTHOUGH THE USE of the winding stem on an alarm clock to trip various mechanical devices is generally known, its adaptation to metallurgical test work is of interest. Manuel Lopez Caballero, mining engineer, Chihuahua, Mexico, reports that he has used the illustrated knife switch successfully in cyanidation, amalgamation, and grinding test work. The switch may also be used to stop pumps at a predetermined time and to shut off lights in mining camps early in the morning.

In preparing the equipment for operation, the alarm is set at a desired time, the knife switch is closed, and a trigger is snapped over one end of the switch as shown. When the alarm goes off, the winding stem rotates, thus tripping the trigger, which permits the knife switch to snap open. The spring which holds the knife switch is in tension while the switch is closed and jerks the switch open when the trigger is tripped. The circuit is broken quickly to avoid chattering or flashing. If a commercial timer is unavailable, this equipment serves as a satisfactory substitute.

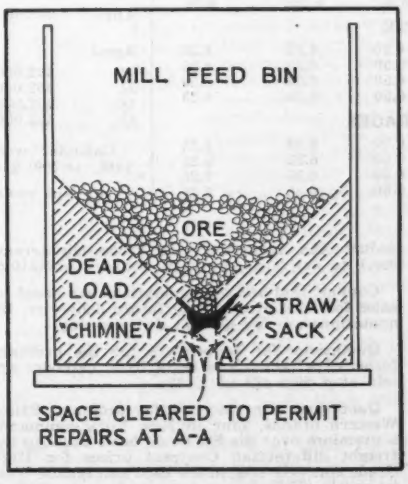



## Straw Sack Speeds Bin Repair

OCCASIONALLY REPAIRS on discharge openings of mill bins are necessary. Normally such repairs require emptying the bin, with attendant disruption of crushing operations. To avoid such delays in repairing the inner lip of the discharge opening of a 600-ton ore bin, Bertrand Robinson, professional engineer, Toronto, Ontario, describes a method used by him on two occasions. The size of feed was minus 1½ in. in one instance, and minus ¾ in. in another.

A large sack was filled with dry straw and thrown into the bin. This traveled down with the ore and blocked passage of moving ore several feet above the bin bottom as shown in the accompanying illustration. Ore below the sack was then removed. After the feeder had been removed from below the discharge opening, repairs were easily made at points marked *A* in the drawing.

After repairs had been completed, the sack was sprayed lightly with kerosene and ignited. Combustion was controlled by regulating the amount of air which was supplied by a lance or miner's blowpipe. Mr. Robinson cautions that this method should not be used in dry wooden ore bins or in sulphide ores. The size of the sack used depends on the size of the discharge opening, and the diameter of the "chimney" in the ore bin.




## *These Pages Belong to You*

They illustrate and describe practical operating ideas which have been devised and tried with success by mechanics, electricians, engineers, mine operators, millmen, and smeltermen in many parts of the world.

This space is reserved for two specific purposes: (1) To enable you to do a good job better by incorporating ideas developed by others. (2) To give you an opportunity to tell others about new methods you have developed.

If you are aware of improved mechanical devices or methods, why not send in a photograph, sketch, or shop drawing of such ideas together with a brief description of their application? *E. & M. J.* pays $5 or more for each idea submitted and published.

# MARKET SUMMARY

CUTBACKS IN PRODUCTION of war materials were announced during April, resulting in a radical change in the supply outlook for major non-ferrous metals. Interest shifted to reconversion, and officials in Washington became active in pushing plans for increasing production of essential civilian products. Reduced war production spread from shipbuilding to ammunition. Though V-E Day was not announced officially, the markets recognized that the European phase of the war had ended. Controls are to be eased, WPB officials stated, as fast as conditions permit.

Copper and zinc were most sensitive to the change of pace on war orders. Buying of both metals declined in volume, and deliveries over the second quarter are expected to fall well below the record established in the Jan.-March period. Purchases of these metals from foreign sources will not be curbed immediately, the industry believes, but stockpiles are likely to grow in size until reconversion makes headway. The period of extreme scarcity in copper has ended. Zinc producers believe that allocation should be dispensed with. The rapid decline in lead stocks has been halted. Metals expected to remain in tight supply for some time to come are tin, antimony, cadmium, platinum, iridium, rhodium, and tungsten. Demand for quicksilver is expected to continue at a high level, but imports will increase to relieve the supply situation in that metal.

Foreign Economic Administrator Crowley revealed that the British have made available under reverse Lend-Lease 30,000 tons of Rhodesian copper in the first quarter, and agreed to supply 42,000 tons in the second quarter, this latter consignment being a part of a total of 175,000 tons requested for delivery to this country over the remainder of the year.

The March statistics of Copper Institute showed that deliveries of refined copper amounted to 218,488 tons, the largest tonnage ever shipped to consumers in a single month. The previous high was 172,585 tons in February. Deliveries of copper to fabricating plants amounted to 536,977 tons in the Jan.-Feb. period. Consumption in the first quarter, based on figures compiled for fabricators, amounted to 490,849 tons. With consumption for war purposes declining, fabricators are certain to reduce their large inventories, the industry believes.

Zinc consumers obtained certification for some 80,000 tons of zinc for May delivery, against 90,000 tons in April. Actual deliveries will be smaller owing to cutbacks that came into the picture after requests for zinc were filed.

Lead restrictions were strengthened

## Major Metals

### U.S. DAILY AND AVERAGE PRICES

| 1945 | Electrolytic Copper: Domestic (a) Refinery | Electrolytic Copper: Export (b) Refinery | Straits Tin: New York | Lead: New York | Lead: St. Louis | Zinc: St. Louis |
|---|---|---|---|---|---|---|
| April | | | | | | |
| 2 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 3 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 4 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 5 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 6 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 7 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 9 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 10 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 11 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 12 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 13 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 14 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 16 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 17 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 18 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 19 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 20 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 21 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 23 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 24 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 25 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 26 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 27 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 28 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 30 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| **AVERAGES FOR MONTH** | | | | | | |
| April | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| **AVERAGES FOR WEEK** | | | | | | |
| April | | | | | | |
| 4 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 11 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 18 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 25 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| **CALENDAR WEEK AVERAGES** | | | | | | |
| April | | | | | | |
| 7 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 14 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 21 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |
| 28 | 11.775 | 11.700 | 52.000 | 6.50 | 6.35 | 8.25 |

THE above quotations for major non-ferrous metals are our appraisal of the important United States markets, based on sales reported by producers and agencies. They are reduced to the basis of cash, New York or St. Louis, as noted. All prices are in cents per pound.

(*a*) Net prices at refineries on Atlantic seaboard. To arrive at the delivered New England basis add 0.225c. per pound, the average differential for freight and delivery charges.

(*b*) Export prices are net at refineries on the Atlantic seaboard and include sales of domestic copper in the foreign market. Owing to the World War and the disruption of normal trade relations, our export copper quotations, since September, 1939, have been based largely on f.a.s. transactions, ex United States ports. We deduct .05c. from the f.a.s. basis (lighterage, etc.) to arrive at the f.o.b. refinery quotation.

Copper, lead and zinc quotations are based on sales for both prompt and future deliveries; tin quotations are for prompt delivery only.

Quotations for copper are for the ordinary forms of wirebars and ingot bars; cathodes are sold at a discount of 0.125c.

Quotations for zinc are for ordinary Prime Western brands. Zinc in New York commands a premium over the St. Louis basis equal to the freight differential. Contract prices for High Grade zinc delivered in the East and Middle West in nearly all instances command a premium of 1c. per pound over the current market for Prime Western but not less than 1c. over the

## Silver, Gold and Sterling

### DAILY AND AVERAGE PRICES

| 1945 | Sterling Exchange: "Checks" (Nominal) | Silver: (c) New York | Silver: London | Gold: London | Gold: (d) United States |
|---|---|---|---|---|---|
| April | | | | | |
| 2 | 402.000 | 44.750 | Holiday | Holiday | $35.000 |
| 3 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 4 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 5 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 6 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 7 | 402.000 | (e) | (e) | (e) | 35.000 |
| 9 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 10 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 11 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 12 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 13 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 14 | 402.000 | (e) | (e) | (e) | 35.000 |
| 16 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 17 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 18 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 19 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 20 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 21 | 402.000 | (e) | (e) | (e) | 35.000 |
| 23 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 24 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 25 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 26 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 27 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| 28 | 402.000 | (e) | (e) | (e) | 35.000 |
| 30 | 402.000 | 44.750 | 25.500 | 168s. | 35.000 |
| **AVERAGES FOR MONTH** | | | | | |
| April | 402.000 | 44.750 | 25.500 | — | 35.000 |
| **AVERAGES FOR WEEK** | | | | | |
| April | | | | | |
| 4 | 402.000 | 44.750 | — | — | |
| 11 | 402.000 | 44.750 | — | — | |
| 18 | 402.000 | 44.750 | — | — | |
| 25 | 402.000 | 44.750 | — | — | |

Calendar week averages, New York Silver: April 7th, 44.750; 14th, 44.750; 21st, 44.750; 28th, 44.750.

(*e*) Not quoted (Saturday).

*Engineering and Mining Journal's* average quotation for Prime Western for the previous month.

Quotations for lead reflect prices obtained for common lead, and do not include grades on which a premium is asked.

(*c*) Silver other than newly-mined domestic, by Handy & Harman. Under Treasury order of July 6, 1939, the price on domestic newly-mined silver mined subsequent to July 1, 1939, was fixed at 71.11c. per troy ounce. Handy & Harman's quotations on newly-mined domestic silver, 999 fine was 70⅝c. throughout April.

(*d*) U. S. Treasury's gold price. Actual payment by the United States Treasury for gold in domestic and imported ore or concentrate is at 99.75 per cent of the price quoted by the Treasury, which is equal to $34.9125.

early in April, partly through further clarification of the order. The Government purchased fair tonnages from foreign sources and the supply situation caused less anxiety in trade circles as April ended.

Tin control is not expected to ease until supplies are again available from Malaya and the Dutch East Indies. WPB officials disclosed that the stockpile has declined from 105,000 tons in 1942 to 70,000 tons in April of the current year.

Quicksilver prices eased on spot, largely to reduce the spread that existed between the immediate position and forward metal. Spanish quicksilver arrived in quantity. Sellers who offered Spanish metal at $152 per flask, duty paid, New York, for April shipment, raised the quotation to $155 on May business. At least four firms offered Spanish quicksilver in this market.

The need for alloys that can withstand high temperatures revived the demand for tungsten.

## Miscellaneous Metals Monthly Averages

Average prices of miscellaneous metals for March and April:

(a) New York, packed in cases, in lots of 5 tons or more but less than a carload. (b) Nominal. (c) Producer's price for commercial sticks. (d) Average producers' and platers' quotations, (e) Special shapes sold to platers.

| | March | April |
|---|---|---|
| Quicksilver, N. Y. flask | 162.000 | 156.840 |
| Antimony (a) | 15.839 | 15.839 |
| Antimony, bulk, Laredo | 14.500 | 14.500 |
| Antimony, bulk, N. Y. | 15.265 | 15.265 |
| Antimony, Chinese (b) | 16.500 | 16.500 |
| Platinum, oz. troy | 35.000 | 35.000 |
| Cadmium (c) | 90.000 | 90.000 |
| Cadmium (d) | 92.500 | 92.500 |
| Cadmium (e) | 95.000 | 95.000 |
| Aluminum ingot | 15.000 | 15.000 |

## E & M J Price Index

Weighted index of non-ferrous metal prices (copper, lead, zinc, tin, silver, nickel, and aluminum). The average for the years 1922-1923-1924 equals 100.

| | | | |
|---|---|---|---|
| 1929 | 110.33 | 1937 | 90.86 |
| 1930 | 82.87 | 1938 | 73.67 |
| 1931 | 60.20 | 1939 | 77.71 |
| 1932 | 48.26 | 1940 | 79.22 |
| 1933 | 59.79 | 1941 | 83.49 |
| 1934 | 69.59 | 1942 | 86.80 |
| 1935 | 74.66 | 1943 | 88.74 |
| 1936 | 73.45 | 1944 | 88.74 |

| | 1943 | 1944 | 1945 |
|---|---|---|---|
| January | 88.74 | 88.74 | 88.74 |
| February | 88.74 | 88.74 | 88.74 |
| March | 88.74 | 88.74 | 88.74 |
| April | 88.74 | 88.74 | 88.74 |
| May | 88.74 | 88.74 | .... |
| June | 88.74 | 88.74 | .... |
| July | 88.74 | 88.74 | .... |
| August | 88.74 | 88.74 | .... |
| September | 88.74 | 88.74 | .... |
| October | 88.74 | 88.74 | .... |
| November | 88.74 | 88.74 | .... |
| December | 88.74 | 88.74 | .... |

## Miscellaneous Metals, Ores, Minerals

Quotations cover wholesale lots, prompt shipment, f.o.b. New York, unless otherwise stated
(May 1, 1945)

### MISCELLANEOUS METALS

| | |
|---|---|
| Aluminum, ingot, 99 plus per cent, lb. | 15c. |
| Antimony, domestic, spot, lb., 5 tons or more | 15.839c. |
| Bismuth, ton lots, lb. | $1.25 |
| Cadmium, commercial sticks, lb. | 90c. |
| Calcium, lb., ton lots, 97 @ 98 percent, cast | $1.85 |
| Chromium, 97 per cent grade, lb. | 89c. |
| Cobalt, 97 to 99 per cent, per lb. | $1.50 |
| Indium, troy oz. | $4.00 |
| Nickel, electrolytic cathodes, lb. | 35c. |
| Magnesium, 99.8 per cent, carloads, lb. | 20½c. |
| Palladium, troy oz. | $24.00 |
| Platinum (Official quotation) troy oz. | $35.00 |
| Quicksilver, flask of 76 lb., 100 flasks or more | $156.00 |
| Selenium, 99.5 per cent, lb. | $1.75 |
| Silicon, minimum 97 per cent, spot, carloads, lb. | 14.75c. |
| Tellurium, lb. | $1.75 |
| Thallium, 100 lb. or more, lb. | $12.50 nom. |
| Titanium, 96 to 98 per cent, lb. | $5.00 |

### METALLIC ORES

| | |
|---|---|
| Beryllium Ore, 8 to 12% BeO, f.o.b. mine, per unit | $14.50 |
| Chrome Ore, per long ton, f.o.b. cars Atl. ports, dry 48% $Cr_2O_3$, 2.8 to 1 ratio | $41.00 |
| 48% $Cr_2O_3$ 3 to 1 ratio | $43.50 |
| Iron Ore, Lake Superior, Lower Lake ports, long ton: | |
| Old Range bessemer | $4.75 |
| Mesabi bessemer | $4.60 |
| Old Range non-bessemer | $4.60 |
| Mesabi, non-bessemer | $4.45 |
| Lead (Galena) 80 per cent, Joplin, Mo., ton | $76.01 |
| Manganese, Metals Reserve Co. sales price, per long-ton unit of Mn contained, 48 per cent, subject to premiums and penalties, effective May 15, 1944: 85c. (duty paid) New York, Philadelphia, Baltimore, Norfolk, Mobile, and New Orleans; 91c., Fontana, Calif., Provo, Utah, and Pueblo, Colo. | |
| Molybdenum Ore, 90%, per lb. of $MoS_2$ f.o.b. mines | 45c. |
| Tungsten Ore, per unit of $WO_3$: | |
| Chinese, 60 per cent, duty paid | $24.00 |
| Domestic, 60 per cent and upward | $24.00@$24.50 |
| Vanadium Ore, per lb. of contained $V_2O_5$ f. o. b. mines | 27½c. |
| Zinc Ore, Prime, 60 per cent concentrate, Joplin, Mo.; per ton | $55.28 |
| (a) Prices at mines, small lots, normally several dollars less. | |

### METALLIC COMPOUNDS

| | |
|---|---|
| Arsenic Oxide (arsenic) lb. | 4c. |
| Cobalt Oxide, 70 @ 71 per cent, lb. | $1.84 |
| Copper Sulphate, 100 lb. | $5.00 |

### ALLOYS

| | |
|---|---|
| Beryllium Copper, 2.5 to 3 per cent Be, per lb. of contained Be | $15.00 |
| Ferrochrome, 65 @ 70 per cent per lb. of Cr contained | 13c. |
| Ferromanganese, 78 @ 82 per cent, gross ton | $135.00 |
| Ferromolybdenum, 55 @ 65 per cent Mo, lb. of Mo contained | 95c. |
| Ferrosilicon, 50 per cent, per lb. of contained Si | 6.60@8.10c. |
| Ferrotungsten, 75 @ 80 per cent, lb. of W contained | $1.90 |
| Ferrovanadium, per lb. of V delivered | $2.70@$2.90 |
| Silicomanganese, 1 per cent C, gross ton | $136.00 |

### NON-METALLIC MINERALS

| | |
|---|---|
| Asbestos, f.o.b. Canadian (Quebec) mines (U.S. funds), ton: | |
| Crude No. 1 | $650@$758 |
| Crude No. 2 | $165@$385 |
| Spinning fibers | $124@$233 |
| Paper stock | $44@$49.50 |
| Shorts | $14.50@$26.50 |
| Vermont, f.o.b. Hyde Park: | |
| Shingle stock | $62.50@$65.00 |
| Paper stock | $44.00@$53.00 |
| Shorts | $14.50@$28.50 |
| Floats | $19.50 |
| Barytes, f.o.b. mines: | |
| Georgia, crude, per long ton | $8.50@$9.00 |
| Missouri, 93 to 94 per cent $BaSO_4$, per short ton | $8.25@$8.50 |
| Bauxite, long ton: | |
| Domestic, crude, 50 @ 52 per cent (not dried) | $5.00 |
| Domestic, chemical, 55 @ 58 per cent | $7.50@$8.50 |
| Domestic, abrasive, 80 @ 84 per cent | $16.50 |
| China Clay, f.o.b. mines, ton: | |
| South Carolina and Georgia, No. 1, bulk | $6.75@$8.00 |
| Delaware, No. 1 | $15.00 |
| Feldspar, bulk, ton: | |
| Potash feldspar, 200 mesh | $17.00 |
| Glass spar, white, 20 mesh | $11.75 |
| Fluorspar, f.o.b. mines, bulk, Kentucky and Illinois 60 per cent, all rail movement, ton | $30.00 |
| Acid 98 and 1 per cent, bulk, ton | $37.00 |
| Fuller's earth, f.o.b. Georgia or Florida, ton | $7.00@$14.00 |
| Magnesite, per ton dead-burned, f.o.b. Washington | $22.00 |
| Mica — Colonial Mica Corp., agent for Metals Reserve Co., quotes full-trimmed ruby muscovite domestic, April 1 to June 30, inclusive — No. 1, $1.70 to $36.65 per lb., depending on size; No. 2, $2.25 to $26.00; No. 2 Inferior, 50c. to $16.00; No. 3, 25c. to $6.25. Prices f.o.b. nearest producer's rifting plant. | |
| Ocher, Georgia, ton | $19.00@$22.00 |
| Pyrites, Spanish, per long ton unit of S, c i f. Atlantic ports | 12c. nom. |
| Silica, in bags, 325 mesh, ton | $20.00@$40.00 |
| Sulphur, Texas, mines, long ton | $16.00 |
| Talc, f.o.b. works, ton: | |
| New York, double air-floated, 325 mesh | $12.00@$15.00 |
| Vermont, extra white, 200 mesh | $9.50@$10.50 |
| Tripoli, Missouri, ton: | |
| 40 mesh, cream colored | $14.50 |

### IRON AND STEEL

| | |
|---|---|
| Pig Iron, Valley furnaces, gross ton: Basic | $24.50 |
| Steel, base price, Pittsburgh Billets, gross ton | $34.00 |
| Structural shapes, 100 lb. | $2.10 |

# WASHINGTON REFLECTIONS

*McGRAW-HILL WASHINGTON NEWS BUREAU*

## Further Power to Reduce Tariff May Be Denied

There is agreement among Washington observers that the act extending power to make reciprocal trade treaties will be passed, but the exact form in which it will be passed was still a matter of considerable speculation as the House Ways and Means Committee got its hearings under way in late April. At that time, the two big questions were whether the extension would be limited to two years or three years and whether the new bill would grant the State Department power to cut tariffs an additional 50 percent.

Congressional opposition in late April was shaping up strictly on party lines. Conservative Democrats who sided with Republicans before the death of President Roosevelt were moving over to the other side. It was generally conceded that the reason was to avoid defeating President Truman in his first major Congressional test.

Interest of the mining industry centers on the proposal to cut tariffs an additional 50 percent. Before the war zinc products, for example, found their position in the domestic market deteriorating because of foreign encroachment. An additional cut in the tariffs of this metal would bring about serious problems for the domestic industry when normal trade conditions are resumed.

## Difficulty Encountered in Meeting Lead Requirements

In mid-April another move was made in a nasty behind-the-scenes fight to prevent users of lead tubes from dipping into the foreign supply of lead available to this country. Tubes, disks, and slugs or any other semi-fabricated form were placed under import control at that time.

When the importation of tubes, lead batteries, and lead foil was banned a few months ago (*E. & M. J.*, March, 1945, p. 106), the purchase of these items in Mexico was stopped as planned. However, this did not prevent the same interests from moving their operation to Canada and importing semi-fabricated tubes, disks, and slugs not covered by the first order.

Although the last loophole seems to be plugged effectively, interested bystanders in Washington expect the battle to continue. As things stood at the end of April all lead brought in from foreign sources comes off the importing manufacturer's quota.

The hard-boiled attitude is explained—at least in part—by the announcement of Erwin Vogelsang, director of WPB's Tin, Lead, Zinc Division, that the supply of lead in the first quarter would fall short of meeting the minimum requirements by 19,000 tons and in the second quarter by 25,910 tons. The supply figures included imports of refined lead.

The situation is so critical that even printers and publishers were warned to return excess type metal containing lead or antimony to their suppliers in accordance with the inventory restrictions of Order M-38. The warning specifically included federal, state, and municipal plants.

The critical supply situation also provoked further curtailment of the uses of lead by an amendment of M-38 listing the end products in which the use of lead was permitted.

WPB officials state privately that they believe lead, like tin, will remain tight even after Japan's defeat.

## Army-Navy Outline Needs For Light-Metals Industry

Aside from a pessimistic attitude of the automobile industry regarding expansion of the use of aluminum and magnesium in motor cars, the most important testimony during the closing days of the light-metal hearings was the interest of the Army and Navy in "insuring the national ability to turn from peacetime to wartime production virtually over night."

The program of the armed services was summed up in three points in their joint statement. These were:

"1. There must be a peactime demand for those materials sufficient to promote aggressive development in their production and in their use.

"2. There must be maintained a means of accelerating their output with great rapidity if industrial mobilization on an all-out basis is ever again necessary.

"3. There must be no exhaustion of our domestic bauxite deposits, for that might well make it impossible for us to produce the weapons which would be required to meet a future national emergency."

## Aluminum Witch Hunt Fails to Discover Victim

Western members of the House were stirred up by the announcement that Metals Reserve Co. had given an affiliate of the Aluminum Company of Canada an order for an additional 250,000,000 lb. of aluminum to be delivered before the end of this year. The announcement was made March 28, while the light-metal hearings were still in progress. This led to a thorough discussion of the Canadian contracts before the Senate Small Business Committee.

Fred M. Vinson, Federal Loan Administrator, said officially:

"This purchase has been made at the request of the War Production Board, which has indicated that domestic production will be insufficient to meet anticipated war requirements due to shortage of manpower and fuels."

This position was maintained stoutly by the officials called to testify before the committee. Among those who appeared was George C. Heikes, who was director of the WPB Aluminum-Magnesium Division at the time the new contract was made. Mr. Heikes, not now in government service, voluntarily took the stand. His testimony was a great disappointment to the Senators and Congressmen who were looking for ulterior motives in the transaction. Mr. Heikes explained the manner in which the military requirements are determined and met. Army demands fluctuate with the war—going up with defeats, which cost men and matériel. They must be met.

At the same time the whole subject of the Shipshaw contracts was probed by the committee "in response to the general feeling in and out of Congress that the facts and circumstances surrounding this contract need to be aired in the interest of better understanding of the situation than now exists."

The resulting testimony got into the record a great amount of information while the men who made the decisions were available. Aside from the historical aspects, no startling revelations were made.

## Premium Payments Will Not Amortize New Investments

Amortization charges for capital expenses will not be allowed as costs in calculating metal quotas under the Premium-Quota plan for copper, lead, and zinc unless specifically authorized in advance by the appropriate division of the War Production Board. These instructions were issued to the quota committee, to become effective April 14.

Most copper, lead, and zinc mines are operating below their capacity because labor is not available. Under such conditions, expansion of mining or processing facilities does not add to the metal output.

Included in the expenditures for

which amortization charges will not be allowed are long-range development and exploration.

At the time the announcement was made, WPB stated that special consideration will be given to projects upon which substantial amounts relative to the total cost of the project had already been spent. It was also explained that quotas are not affected by this order that had been assigned heretofore on a basis of full amortization of wartime capital expenses in mines that probably cannot be operated without subsidy payments.

## WPB Divulges Plans for Hastening Reconversion

It was not until the first of April, when the favorable outcome of the war in Europe was assured without any question, that a WPB "Victory-in-Europe" program that would free the national economy from wartime controls was made public in the Second Report of Mobilization and Reconversion Director Byrnes to Congress and the President. At this time the procedures that will probably be followed in handling cutbacks after V-E Day were stated by Mr. Krug as follows:

"1. Cutbacks will be handled, wherever practicable, in such a way as to distribute equitably the production load throughout the nation.

"2. Positive assistance through controlled material allotments and preference ratings for new or additional production of a very limited number of civilian products now in such short supply as to endanger the war-supporting economy.

"3. Measures to facilitate rapid reconversion through positive assistance for tools, equipment, construction, and long lead-time materials and components needed to begin large-scale production promptly when further cutbacks occur.

"4. Suspension of most of the so-called 'rating floors', which now prohibit the acceptance or delivery of materials, components and equipment on unrated orders. There may be some exceptions in the case of scarce commodities and components.

"5. 'Open-ending' CMP [the Controlled Materials Plan], by permitting the delivery and acceptance of controlled materials (steel, copper, or aluminum) without allotments, subject to preference at mills and warehouses for all orders covered by allotments.

"6. Relaxation or suspension as quickly as practicable of a substantial number of WPB's 'L' and 'M' orders that now prohibit or restrict production and distribution. WPB will continue to limit the production of some goods requiring materials still in scarce supply.

"7. Revocation of most of the conservation orders specifying the kind of materials to be used in making certain products.

"8. Some relaxation in the construction order L-41 to permit the most urgently needed civilian construction.

"9. Take steps to insure that, where production is authorized on a restrictive basis, small business and new producers are given full opportunity to participate.

"10. Introduction of a simplified priority system to replace CMP and other priorities at the earliest possible date.

"11. Procedure for authorizing construction or production in certain local areas, as exceptions to nation-wide limitation orders, to permit utilization of labor and resources that cannot practicably be used for war production or civilian manufacture not under limitation orders.

"12. WPB will continue specialized controls over all materials continuing in tight supply such as tin, crude rubber, textiles, lumber, and certain chemicals, to assure meeting all essential war and civilian needs."

In mid-April Mr. Krug announced further steps to assist the reconversion of industry to civilian production. The criteria that will be used in authorizing such minor amounts of construction as might be necessary to start production of civilian items and to secure the tools and equipment to assist industries with long lead-time tools to resume civilian production were stated.

Cutbacks in munitions production that are expected after V-E Day are estimated at 12 percent of the present program by the end of the first quarter, 20 percent by the end of the second quarter, and from 35 to 40 percent before the end of the year following the defeat of Germany. This is merely an estimate and indicates that the plan of reconversion is actually a reduction in war production to be made step by step to give industry a chance to reconvert in an orderly way. As war production goes down month by month, it is the hope of the authorities in WPB to built up the domestic economy.

The power of the Board will be used to protect the war. All of its priority and directive power will be aimed at aiding the Pacific war following the fall of Germany. After the defeat of Japan it is the intention of the War Production Board to liquidate as rapidly as possible. If necessary the reconversion that is being broadly planned will be followed up company by company to help industry over the bumps on the reconversion road.

## WLB Orders Pay From Rim of Santa Rita Pit

On April 20, WLB ordered Kennecott Copper Corporation to pay employees for travel time from the rim of the Santa Rita (N. M.) pit to working places in the pit. The Board did not specifically designate the amounts of travel time, the points for going on duty, or the rates of pay for travel time, but directed the company and the unions to settle these points by negotiation. The case had been referred to the Board by the Non-ferrous Metals Commission because of the national significance of the dispute.

This decision is the outgrowth of the ruling by the Wage-Hour Administration that mine wages should be computed from "collar-to-collar." This ruling was sustained by a seven-man majority Supreme Court decision March 27, 1944, of a portal-to-portal-pay dispute involving three Alabama iron mine operators, Republic Steel, Sloss-Sheffield Steel, and Tennessee Coal & Iron Co. (*E. & M. J.*, April, 1944, p. 102).

With unions seeking all possible opportunities to get around the Little Steel formula, it seems quite likely that the portal-to-portal dispute may spread to all kinds of large industrial plants where important time is consumed in travel between parking lots and working places.

## Bill Would Withhold Potash and Phosphate

Fertilizer mineral reserves on the public domain will be withheld from all private exploration if Senator Lister Hill's bill, S.882, to establish a national fertilizer policy is passed by Congress. The important paragraph which explicitly forbids private exploration and prospecting is Section 601, which reads:

"The remaining reserves of phosphate and potassic minerals in the public domain are hereby declared to be essential to the public interest in the conservation and maintenance of the Nation's soil resources and it is hereby declared to be the policy of the Congress that said reserves shall be held by the Government as a public trust in perpetuity and primarily for the purpose described in title I hereof."

Read in conjunction with Title I and more particularly with paragraph (a) (3), Section 103 of the bill, it would also put the government into the business of manufacturing fertilizers in direct competition with private industry. This paragraph reads:

". . . facilitate the acquisition or construction of the additional plants and plant facilities for the production of mineral fertilizers in volume commensurate with determined soil requirements; . . ."

The bill was drafted by the American Farm Bureau Federation. Apparently there is an alliance of the American Farm Bureau Federation and the factions favoring public ownership.

The big issue in the 1946 election is already shaping up. It will be the question of government in business. This is the opinion of Washington observers of long experience in interpreting political matters.

# NEWS OF THE INDUSTRY

## Tariff Commission Reviews Magnesium Industry

In response to requests of Congressional committees, the U. S. Tariff Commission has prepared and released a report on the status of the magnesium industry and its probable postwar position in trade and international competition. The following information is digested from the report:

Of the 16 magnesium producing plants listed in the accompanying table, four government-owned and three privately owned plants were in operation during the first quarter of 1945, having a capacity of 134,000,000 lb. per year. The average of lowest monthly operating costs experienced by eight government-owned plants was 19.1c., slightly below the ceiling price of 20.5c per pound. (See table.)

It is estimated by the Dow Chemical Co. that domestic consumption of magnesium for the first few years after the war will be as follows:

| Use | Million Pounds |
|---|---|
| Automobiles and trucks | 25.0 |
| Aircraft | 10.0 |
| Railway equipment, trailers, bicycles, and motorcycles | 5.0 |
| Water transport | 0.5 |
| Portable tools and office equip. | 10.0 |
| Aluminum alloys | 10.0 |
| Deoxidizers and scavengers | 2.0 |
| Miscellaneous | 2.0 |
| Total | 64.5 |

The two concerns which seem most likely to survive the great reduction in demand for magnesium after the war are the Dow Chemical Co. and the Permanente Metals Corporation, a Kaiser controlled enterprise which could supply the postwar Pacific Coast market. It is improbable that private concerns would want to take over other government-owned plants, unless estimates of postwar consumption are far too low.

The U. S. Bureau of Mines estimates world production in millions of pounds by countries, as follows:

| Country | 1938 | 1943 |
|---|---|---|
| Australia | ... | 1.8 |
| Canada | ... | 7.2 |
| France | 4.0 | 6.6 |
| Germany | 31.1 | 110.2 |
| Italy | .2 | 11.0 |
| Japan | 3.3 | 33.0 |
| Norway | ... | 4.4 |
| Switzerland | 1.6 | 3.3 |
| Soviet Union | 1.1 | 11.0 |
| United Kingdom | 4.9 | 37.5 |
| United States | 6.4 | 367.2 |
| Totals | 52.6 | 593.2 |

To produce magnesium economically and thus be able to meet competition in world markets, a country should have (1) easy accessibility to magnesium-bearing raw materials, (2) cheap electric power, (3) a large domestic market, and (4) long years of experience in electro-chemical production. The United States and Germany are best qualified in these respects. Even if Germany is permitted to produce after the war, it is improbable that the United States will find it advantageous to import standard magnesium alloys from there. If the present U. S. tariff on magnesium metal and scrap which is 40c per pound, were reduced, or if magnesium were placed on the free list, it is doubtful whether magnesium imports would increase.

### Rated Annual Production Capacity and Cost of Magnesium Plants in U. S.

| Ownership and Operating Company Privately owned: | Plant Location | Process* | Annual Capacity, Million Pounds | Production Cost in Cents Per Pounds† |
|---|---|---|---|---|
| Dow Chemical Co. | Midland, Mich. | E | 18 | ... |
| Dow Chemical Co. | Freeport, Tex. | E | 18 | ... |
| Permanente Metals Corp. | Permanente, Calif. | C | 24 | ... |
| Total privately owned | | | 60 | |
| Government owned: | | | | |
| Dow Chemical Co. | Freeport, Tex. | E | 18 | ... |
| Dow Magnesium Co. | Velasco, Tex. | E | 72 | 11.5 |
| Dow Magnesium Co. | Marysville, Mich. | E | 72 | 18.4 |
| International Minerals & Chemical Co. | Austin, Tex. | E | 24 | 20.3 |
| Diamond Magnesium Co. | Painesville, Ohio | E | 36 | 16.6 |
| Basic Magnesium, Inc. | Las Vegas, Nev. | E | 112 | 18.0 |
| Mathieson Alkali Works, Inc. | Lake Charles, La. | E | 54 | ... |
| New England Lime Co. | Canaan, Conn. | F | 10 | 22.2 |
| Magnesium Reduction Co. | Luckey, Ohio | F | 10 | 18.3 |
| Electro Metallurgical Co. | Spokane, Wash. | F | 48 | ... |
| Ford Motor Co. | Dearborn, Mich. | F | 40 | ... |
| Amco Magnesium Corp. | Wingdale, N. Y. | F | 10 | ... |
| Permanente Metals Corp. | Manteca, Calif. | F | 20 | 27.8 |
| Total government owned | | | 526 | |
| Grand total | | | 586 | |

*(E) Electrolytic, (C) Carbothermic, (F) Ferrosilicon.
†Allowances for depreciation and obsolescence not included. Lowest monthly cost.

### You Can Help

*Paper is a Number 1 war material shortage. Over 700,000 war items are packaged, made, or wrapped with paper. So please:*

1. *Share this magazine with your associates because the number of copies is limited by the paper shortage.*
2. *Organize a continuous drive in your plant and office to collect waste paper for salvage. Clean out old files, obsolete records, and dead correspondence.*

## Mining Men Liberated In the Philippines

Supplementary to the list published last month (*E. & M. J.*, April, 1945, p. 122) the editors have culled the following names from releases Nos. 22 to 44 inclusive, issued by the War Department up to and including April 12, 1945. Names from subsequent releases will be published later. No indication is given of the whereabouts of these people, but emergency addresses in the United States can be obtained from the Editor of *E. & M. J.*

Barnes, John Wallace
Barnes, Richard P.
Bartlett, Sidney S., Mildred G.
Boyens, Ernest F.
Burmeister, Harry L., Helen M.
Butler, Mr. & Mrs. John N.
Casanave, Andres, Theresa, Pedro, Emilio, Pedro, Jr., Pedro, A., IV Jr., Pedro, A., IV
Cort, Marcus R.
Crosby, Ralph W., James C., Flora Colbath
Delahunty, Frank Eric, Edyth
DeWitt, Clyde A.
Ferrier, John William, Jr.
Fittinghoff, Nicholas A.
Fletcher, Charles F.
Gaillard, John G.
Hanson, Rolf H., Donnie Taylor
Hard, Herbert William
Harshman, Mr. & Mrs. Elbert N.
Henderson, Barclay C.
Hix, Roy M., Inna Ree
Hubbard, Charles R., Christine
Kneebone, Eugene J., Mary E., Kathryn M., Terrence H.
Lacey, Merrell G.
Livingston, Carroll C., C. C. Jr., Allen B.
Marsden, Ralph W.
Matsen, Edward
Morehouse, Francis B.
Mulryan, James Raymond
Roebuck, Brooks W., May E.
Salter, Russel
Scheuermann, Gustav J., Helen F., Gwendolyn, Dennis F.
Shoemaker, Abbott H.
Small, Frank S. Elizabeth S., Helen
Thompson, James V., Marie H.
Todd, George Jr.
Walker, Orion L.

## American Zinc Institute Elects New Officers

The following officers were elected at the annual meeting of the board of directors of the American Zinc Institute, Inc., in New York on April 17: H. I. Young, president; C. M. Chapin, Jr., R. B. Caples, and O. W.

Bilharz, vice presidents; R. F. Orr, treasurer; E. V. Gent, secretary.

The following directors were elected to fill vacancies on the board: O. W. Bilharz, president, Tri-State Zinc & Lead Ore Producers Association; J. M. Bowlby, president, Eagle-Picher Co.; E. V. Daveler, vice president, American Zinc Lead & Smelting Co.; Henry Hardenbergh, president, New Jersey Zinc Co.; and H. E. Son, president, Hegeler Zinc Co.

The following directors whose terms expired were reelected: R. B. Caples, Anaconda Copper Mining Co.; S. A. Easton, Bunker Hill & Sullivan Mining & Concentrating Co.; Clarence Glass, Anaconda Sales Co.; G. W. Potter, Joplin, Mo.; A. L. Queneau, U. S. Steel Corporation; F. A. Wardlaw, Jr., International Smelting & Refining Co.; and H. I. Young, American Zinc, Lead & Smelting Co.

## Metals Reserve Co. Reports on Activities

Activities of the Metals Reserve Co. from June 28, 1940, to Nov. 1, 1944, were made public on March 27 in a report by Charles B. Henderson, president of MRC. Created as a subsidiary of RFC in 1940, MRC has been authorized to produce, acquire, carry, sell, and deal in strategic metals and minerals pursuant to recommendations of the Department of State, FEA, WPB, OPA, War Department, Navy Department, Treasury Department, and the War Shipping Administration.

Forty-nine minerals and metals have been acquired through transactions in 51 foreign countries and territories, 38 States of the Union, and Alaska and the Philippines. From June 28, 1940 through Oct. 31, 1944, MRC reports:

| | |
|---|---|
| Total expenditures | $2,041,350,000 |
| Income from sales to industry | 1,086,393,000 |
| Net expenditures | $ 954,957,000 |
| Inventory at market, Oct. 31, 1944 | 574,132,000 |
| Other assets | 80,980,000 |
| Cost to government | 299,845,000 |

Of the $299,845,000 cost, $151,200,000 represents domestic copper, lead, and zinc premium payments.

Commodity programs for important minerals as disgested from the MRC report are in part as follows:

**Copper.** The war demanded importation of as much copper as possible to augment the normally self-sufficient U. S. production. During a four-year period MRC has handled copper metal worth more than $400,000,000 from large companies in Latin America.

To stimulate domestic production, premium payments of 5c per pound, totaling $53,609,000, have been paid up to Oct. 31, 1944, on 990,038,000 lb. of copper produced in excess of established quotas based on 1941 production. Premiums are paid on about 17 percent of the total domestic production.

**Lead.** Direct purchases of refined lead from producers in Canada, Mexico, Peru, and Australia have amounted to nearly 1,000,000 tons, costing over $100,000,000. Substantial quantities of lead ore have been obtained by MRC and USCC in Africa, Australia, Latin America, and Newfoundland, and have been sold to domestic smelters.

Domestic producers were subsidized with a 2¾c per pound premium for over-quota production. However, as production continued to decline, supplementary "B" quotas were established entitling certain producers to receive 5½c per pound for production in excess of such quotas. As of Oct. 31, 1944, premiums paid on the production of 752,638,000 lb. of lead in excess of 1941 production totaled $24,083,000. At present premiums are paid on 27 percent of the total domestic production.

**Zinc.** Expanding munitions production before Pearl Harbor resulted in importation of foreign zinc ores for smelting in domestic plants. Because private importers could not pay prices to miners in Bolivia, Argentina, Peru, and Australia sufficient to insure continued production, and because of high costs of ocean freight and insuranec plus U. S. import duty, MRC contracted for zinc in 1941 at prices attractive to miners and which resulted in no loss to the government other than absorbing a part of the import duty, thus off-setting increased freight rates. MRC has imported 800,000 tons of zinc concentrates by sea and 620,000 tons by rail.

Four programs increased domestic smelting capacity by about 200,000 tons of zinc metal annually. Long-term contracts were made with American Smelting & Refining Co. encouraging construction of the electrolytic plant at Corpus Christi, Tex.; with Anaconda, which enabled the company to increase electrolytic production in Montana by 40 percent; with American Zinc Co. of Illinois to provide ore supplies for the new DPC facilities at its Monsanto and Fairmont City plants in Illinois; and with U. S. Zinc Smelting Co. for expansion of its West Virginia smelter.

A basic premium of 2¾c per pound was provided for domestic over-quota production. Depleted high-grade ore resources in many principal producing areas led to special B and C quotas which enabled certain small mines to receive as much as 8¼c per pound premium for excess production. As of Oct. 31, 1944, premiums amounted to $73,507,000 on 1,941,113,000 lb. of zinc produced in excess of established quotas. At present premiums are paid on about 43 percent of total zinc production.

To assist zinc smelters operating on Tri-State concentrates a subsidy of $5.28 per ton of concentrates is paid on zinc concentrates. It is estimated that this program may cover 400,000 tons of concentrates annually.

## Postwar Outlook Favorable For Western Steel Plants

The war-expanded Western steel industry is in a favorable position to continue production at a reasonably satisfactory rate after the war, "provided some obstacles—serious though not insurmountable—are overcome," according to a recent report prepared by H. Foster Bain, consulting engineer of the U. S. Bureau of Mines.

Mr. Bain lists the following barriers to postwar operation which must be overcome:

1. Recapitalization to eliminate that part of the investment chargeable to war expenses, and provision of adequate financial backing to meet post-war adjustments.
2. An aggressive marketing program to develop outlets for more steel products.
3. Radical adjustments in freight rates.
4. Technical progress to overcome limiting effects of certain impurities in Western iron ores, deficiencies in Western coking coals, possible future deficiencies in local scrap supply.

Mr. Bain lists three conclusions:

1. Adequate raw materials are available and defects in quality can be overcome. Reasonably competitive costs can be obtained.
2. Existing markets can support production in plants of economic size.
3. Under capable management, operating with competitive conversion costs should be possible.

The complete report, "A Pattern for Western Steel Production," is published by the U. S. Bureau of Mines in Information Circular 7315.

## NEWS BRIEFS

**Republic Mining Company Changes Name.** The Republic Mining & Manufacturing Co., which has been a 100 percent subsidiary of the Aluminum Corporation of America since 1909, has changed its name to Alcoa Mining Co. to identify it more closely with the parent corporation.

**Plants Declared Surplus.** The Surplus Property Board disclosed in its monthly report for February that 80 government-owned aluminum and magnesium plants have been declared surplus or excess. Twenty-three of the plants were on a standby basis, 46 were declared surplus and ready for disposal, and 11 were being used as disposal centers and warehouses. Each of the plants cost more than $15,000,000.

**Magnetic Anomaly Discovered.** The U. S. Geologic Survey recently announced that as a result of its search to develop iron-ore reserves near eastern steel-producing areas, an important magnetic anomaly was discovered about a mile southeast of Bechtelsville, Pa.

# Attention Is Directed to Reconstruction at Canadian Institute's Quebec Meeting

Keynote of the program of the annual general meeting of the Canadian Institute of Mining and Metallurgy, which was held this year in the Chateau Frontenac, in Quebec, on April 17 to 19, was "Mining and Reconstruction," a circumstance that reflected the recent appointment of the Institute's president, A. A. MacKay, as Coordinator of Resources Development in the new Department of Reconstruction at Ottawa. The well-chosen list of technical papers and the pleasant social functions that are always a feature of the annual meeting combined to make a program worthy of the attention of the 600 and more mining men who registered, coming from all parts of the Dominion.

The president-elect for 1945-46, succeeding Mr. MacKay, is Alan E. Cameron, Deputy Minister of Mines for Nova Scotia. E. J. Carlyle continues as secretary.

Responding quickly to the challenge to the mineral industry to do its best to help the Dominion in the days to come, which challenge is inherent in the creation of the Ministry of Reconstruction and the new appointment of Mr. MacKay, various Institute committees convened during the session to give the matter thought. One of these, the strong Committee of the Mineral Industry, appointed last January, proposed, as its objectives, to support the constructive effort of any Minister of Mines on behalf of the industry, to discourage any proposals involving ill-advised expenditures, and to assist the industry to play its full part in rehabilitation and reconstruction. At this, its initial meeting, it decided to cooperate to the fullest extent with the Interprovincial Committee of the Mining Industry, composed of the provincial Ministers of Mines, who also met just before the convention opened.

Mr. MacKay, who had previously taken a leading part in preparing to reconvert the mines to peace-time activities, discussed this matter at the opening session. The percentage of enlistments from Canada's mining industry had been very high, he said. Surveys of manpower were being made in various districts. He suggested that the respective Geological Surveys, which have been becoming more important in the industry's development, should increase the number of field parties by way of help; also that the "shockingly low" remuneration paid in these Surveys should be increased.

### Statistics for Background

Also speaking at this session was W. H. Losee, of the Dominion Bureau of Statistics, who presented his detailed preliminary report on Canada's mineral production in 1944, a feature of which is that the past five years' output for each item is shown, as well as exports and imports for 1943 and 1944. A. E. MacRae discussed "The Professional Engineer and Scientist in Social Relations." A paper by George C. Bateman, former Metals Controller and now Canada's representative on the Joint Production Board in Washington, was read by K. J. H. Clarke.

Taking "Some Problems of Reconversion" as his topic, Mr. Bateman expressed the view that the mining of base metals in the Dominion would have to be curtailed severely unless export markets could be found for the greater portion of the output. He also cautioned against optimism as to the likelihood of the price of gold being raised.

The use of airplane in prospecting and the types of planes available were discussed by H. A. "Doc" Oaks, of Port Arthur, Ont., who pointed out that the economics of air transport, overlooked during the war, cannot be ignored by mining companies in the postwar period. In "frontier flying," he said, you want to fly into a country rather than over it and your plane is selected accordingly. Planes suitable for the great northern areas must be built.

A paper, on "Aero-prospecting in the Yellowknife Area," was presented later by A. W. Jolliffe, of the Dominion Survey.

Practical advice, based on experience, on how to examine a mineral prospect and how to report on it was given by J. A. Reid and C. C. Huston, of Toronto, who attempted to provide certain standards in use by fellow engineers.

### Lineaments and Geology

The outstanding feature of the sessions on geology was the informal discussion of "Research and Canadian Geology," by Col. J. T. Wilson, formerly with the Dominion Survey. Much research has been going on during the war, according to Colonel Wilson, that may be useful to the prospector after it is over. Most interesting, however, was his absorbing discussion, illustrated with maps, of the possibility of getting new ideas about mineral occurrences in the Dominion by plotting on large-scale geologic maps the lineaments taken from topographic maps and aerial photographs. "These lineaments *do* seem to have some strong meaning in geology." Incidentally, he wondered "why we have a structural map of the Pre-Cambrian in the United States where it is not exposed and do not have one in Canada where it is exposed."

Other papers on geology dealt with fault zones in the Noranda and Abitibi areas, by M. E. Wilson and G. W. H. Norman, respectively, and with structure at the Lamaque mine, by H. S. Wilson, of Bourlamaque.

### A Metallurgy Division

For the first time Institute members interested in metallurgy gathered as a separate Metallurgy Division, organization of which has been authorized by the Council. W. B. Boggs, superintendent of the Noranda smelter, in a paper by himself and J. N. Anderson and W. L. Stevens, of the Noranda staff, told of the remarkable work done at the smelter from 1939 to 1945 in establishing a new high for tonnage and continuous operation during these war years by new methods of construction. Over 2,000 tons of copper ores per day were smelted in one furnace, compared with 1,500 tons prior to 1939. Use of suspended roofs on furnaces built of magnesite brick has almost eliminated lost time for repairs.

New practice in reconditioning detachable bits and rods and new equipment for doing it in the Hudson Bay shop at Flin Flon were described in a paper by W. M. Adams, who is in charge of the shops. This was read by J. A. DeBondy, of Winnipeg.

J. Meier, of the Bureau of Mines at Ottawa, dealt with the problem in postwar planning presented by Canada's enormous wartime expansion in output of base metals and light metals. He described some of the late developments in providing stronger and more suitable metals and alloys.

### Film on Asbestos

Mining and milling operations of the Canadian Johns Manville Co., at Asbestos, Que., were strikingly depicted in colored motion pictures by the company's staff, following an illustrated description by George Borror of the procedure used in core drilling for asbestos. Other papers at the Industrial Minerals sessions included one on "Ceramics and Industrial Minerals," by W. G. Worcester, of Saskatoon, Sask., and one on "Canadian Sources of Aluminum," by Dr. E. C. Harder, of Montreal.

In a separate session on milling, four papers were included, the first one dealing with the Sherritt-Gordon company's mill at Sherridon, Man. It was presented by H. H. Hales, mill superintendent. G. F. Reynolds, Bissett, Man., discussed the "Chemistry of Mill Solutions." Norman Hedley, of the American Cyanamid Co., at Stamford, Conn., discussed two papers, one on "Copper Cyanogen Complexes," by himself and D. M. Kentro, and another by himself and J. Kress, on "Cupriferous Gold Precipitates."

### Labrador's Iron Ore

One of the most interesting talks of the three-day meeting was given at the final session by Dr. J. A. Retty, chief geologist of the Labrador Mining & Exploration Co., his

(*Continued on page* 117)

## NMC Denies Increases To Anaconda Workers

The Non-ferrous Metals Commission has denied general wage increases of from 85c to $2.50 a day to 8,000 miners and craftsmen employed in Montana and Idaho mines and plants of the Anaconda Copper Mining Co., J. Glenn Donaldson, chairman, announced March 25.

The commission's directive also denied an increase of 85c a shift to 75 employees of the American Smelting & Refining Co., East Helena, Mont.

In denying the increases, the commission accepted the recommendation of its hearing officer, Robert C. Williams, who found that (1) present wages are not substandard, (2) wages are not below the sound and tested rates set up for the area by the WLB, (3) the Little Steel Formula has been exhausted, (4) no claim was made by the unions of intraplant inequities, and (5) the unions did not present arguments which would support a finding of a "rare and unusual" case.

The companies were ordered to include night-shift premium pay in computing vacation pay for all employees except electricians, where the point was not at issue. Union demands for sick leave and a guaranteed annual wage were denied. The commission also denied the Anaconda company's request for bi-weekly paydays. Involved in the dispute were the Butte, Anaconda, Great Falls and East Helena, Montana, and Conda, Idaho operations of the Anaconda Copper Mining Co.

## Annual Reports List 1944 Metal Production

**Anaconda Copper Mining Co.** reports the following production including output from the company's domestic and foreign mines, metals treated on toll, and metals recovered from purchased material:

| | 1943 | 1944 |
|---|---|---|
| Copper, lb. | 1,296,801,140 | 1,195,223,947 |
| Zinc, lb. | 514,624,263 | 473,978,086 |
| Lead, lb. | 76,951,157 | 68,970,626 |
| Silver, oz. | 13,869,220 | 11,105,295 |
| Gold, oz. | 137,852 | 105,333 |
| Manganese, long tons (a) | 114,327 | 117,781 |
| Assay (Mn) | 61.12% | 60.62% |
| Arsenic, short tons | 10,212 | 9,745 |
| Cadmium, lb. | 2,262,332 | 2,036,612 |
| Molybdenite, lb. | 3,674,990 | 2,986,396 |

(a) Nodule Production.

The annual report states that there was no important change in the production of miscellaneous products, such as bismuth, gallium, indium, nickel sulphate, palladium, platinum, selenium, tin, vanadium red cake precipitates, white lead, and zinc oxide.

**United States Smelting, Refining & Mining Co.** The following figures include production from custom ores but do not include bullion or other materials treated on a toll basis. Metals in ore and other products which have been sold before the completion of all reduction processes are included on the basis of estimated recoverable content.

| | 1943 | 1944 |
|---|---|---|
| Gold, oz. | 171,427 | 167,863 |
| Silver, oz. | 22,141,633 | 20,715,424 |
| Lead, tons | 50,558 | 46,859 |
| Zinc, tons | 41,616 | 41,944 |
| Copper, tons | 1,899 | 1,844 |

**Cerro de Pasco Copper Corporation and Subsidiary Companies.** The following principal metals were produced from ores and concentrates obtained from mines at Cerro de Pasco, Morococha, Casapalca, and San Cristobal, owned or leased by the corporation, and from custom shippers:

| | 1943 | 1944 |
|---|---|---|
| Copper, lb. | 62,630,481 | 58,866,313 |
| Silver, oz. | 12,657,521 | 9,625,743 |
| Gold, oz. | 47,134 | 48,294 |
| Lead, lb. | 94,353,087 | 84,311,169 |
| Zinc concentrates, tons | 25,067 | 26,741 |

**Hudson Bay Mining & Smelting Co., Ltd.** Ore mined and hoisted during 1944 was 2,059,206 tons at an average rate of 5,626 tons per day. Average assay of the ore was 0.091 oz. gold, 1.37 oz. silver, 2.59 percent copper, 4.7 percent zinc. After allowing for metals due on account of custom concentrates, the company shipped for its own account the following:

| | |
|---|---|
| Gold, oz. | 145,441 |
| Silver, oz. | 2,017,443 |
| Copper, lb. | 86,481,746 |
| Selenium, lb. | 136,299 |

In addition, the cadmium plant produced 140,560 lb. of metallic cadmium, and the zinc plant produced 102,458,756 lb. of slab zinc.

**Bunker Hill & Sullivan Mining & Concentrating Co.** Sales in 1944 included 54,317 tons of lead, 15,616 tons of zinc, 834 tons of antimony, 525 tons of copper in byproducts, 6,708,749 oz. silver, and 3,150 oz. gold.

**Inspiration Consolidated Copper Co.** During 1944 4,016,784 tons of ore were mined at an average rate of 12,916 tons per day. The ore assayed 1.175 percent total copper, of which 0.586 percent was oxide and 0.589 percent was sulphide. Copper production for the year totaled 81,996,557 lb. The sulphuric acid plant produced the equivalent of 33,262 tons of 100 percent acid.

**Noranda Mines, Ltd.** Production of copper in 1944 at the smelter of Noranda Mines, Ltd., Canada, was 113,086,814 lb., against 132,762,100 lb. in 1943 and 141,661,397 lb. in 1942, according to the annual report to stockholders. Smelter output of gold last year amounted to 246,990 oz., and silver production 1,373,482 oz.

Canadian Copper Refiners, Montreal East, in 1944 produced 103,000 tons of copper, 396,000 oz. of gold, 3,380,000 oz. of silver, and 235,000 lb. of selenium. The new copper sulphate plant will be in operation in May. Capacity will be sufficient to take care of Canada's requirements.

**Miami Copper Co.** Total production of 56,149,166 lb. of copper produced at the Miami Mine included 49,701,832 lb. obtained from 4,717,138 tons of sulphide ore, 5,159,222 lb. obtained from 1,046,827 tons of solution leached from broken gob over abandoned portions of the mine, and 1,288,112 lb. produced by leasers on company property.

The Castle Dome Copper Co., Inc., a wholly owned subsidiary of the Miami company, produced 49,743,367 lb. of copper from open-pit operations. Leasers operating on company claims produced an additional 244,162 lb. of copper. Ore mined and milled totaled 4,107,975 tons, and waste rock mined totaled 6,950,980 tons.

## NMC Refuses to Approve Incentive Travel Pay

The Non-ferrous Metals Commission has refused by a vote of 3 to 3 to approve payment of travel expenses to and from work granted to employees of the New Park Mining Co., Utah, who stay at work 95.5 percent of working time.

Most of the company's employees live in two small towns from which the round-trip fare is 35 and 40c respectively. The company, War Manpower Commission, and Local 99 of the MM&SW International Union agreed on a plan to pay travel time which was put into effect on Nov. 1, 1944, and reduced total absenteeism from 18.5 percent to less than 7 percent, and reduced avoidable absenteeism from 9.5 percent to 3.5 percent in November, 4.0 percent in December, and 3.7 percent in January, 1945.

The plan was voted down by two employer members of the commission and J. Glenn Donaldson, chairman, a public member, who said: "The reason three members of the commission voted against approving this plan was that approval of any plan to include travel pay, whether as an attendance incentive or not, would have meant opening up the issue of travel pay at every mine under the commission's jurisdiction." He added that the decisions involved would be an impossible task. No attempt was made by NMC to make the decision retroactive, thereby to deprive the New Park workers of the extra travel pay they have already received up to March 15.

The decision led to a brief strike at the New Park mine on March 23 and 24, which was ended on appeal from Captain Farrell of the Ninth Service Command in Salt Lake City, who told the workers how badly lead was needed, and promised that the Army and WMC would do their best to get the decision reconsidered by the NMC or WLB.

The New Park company, union, and WMC joined in filing a petition for rehearing with NMC. This petition has been denied, and the case has been sent to the National War Labor Board in Washington on appeal.

# NEW BOOKS

**THE ROMANCE OF MINING.** By T. A. Rickard. The MacMillan Company of Canada, Ltd., 1944. Pp. 450. Price $3.75.

This interesting story, received belatedly for reasons unknown, covers a limited selection of subjects of particular interest, more likely to engage the average reader than the same author's "Man and Metals." Mr. Rickard's ability to make sound knowledge entertaining is so well known to mining men that it requires no elaboration. Chapter titles in the book are: The Prospector; Discovery; The Golden Fleece; The Silver of Laurium; Frobisher's Quest; El Dorado; The Discovery of Gold in California; The Australian Diggins; The Mountains of Colorado; The Copper Queen Mine; Gold and Furs in British Columbia; The Gold of the North; The Diamonds of Kimberley; The Witwatersrand; New Guinea Gold; and The Flag Follows the Pick.

We are sure that anyone interested in the great epics of mining will gain satisfaction from reading this book.

**GOLD AND THE GOLD STANDARD.** By Edwin W. Kemmerer. McGraw-Hill Book Co., Inc., New York. Pp. 238. Price $2.50.

An interesting, concise discussion of the history of gold as money, characteristics and varieties of the gold standard, its merits and defects. The book closes by recommending a return to an international gold standard in the future as a national policy of sovereign nations, in voluntary cooperation with an international advisory organization. The author endorses full convertibility of currencies to gold.

**MINING BY BLOCK CAVING.** By **Philip B. Bucky, Associate Professor of Mining, School of Mines, Columbia University, New York, N.Y. Pp. 104.**

The handbook consists of a series of articles reprinted from *The Explosives Engineer* describing block caving methods in 9 mines in the United States and Canada. Dr. Bucky's thorough compilation of data enables the reader specifically interested in block caving methods to answer two questions; (1) What orebody conditions make it advisable to use block caving procedures? (2) What practices and procedures in use at block caving properties might be employed elsewhere to obtain greater production, lower operating costs, and greater safety?

Mining students and instructors will find the handbook essential for reference. Topics treated in the description of each property include: general operating data, wage rates, orebody dimensional factors, geologic features, résumé of mining methods, sequence of operations, block dimensions, ore drawing; and miscellaneous information on hoisting, ventilation, drainage, and safety.

**INTERNATIONAL TRIBUNALS.** By Manley O. Hudson. Published by the Brookings Institution and the Carnegie Endowment for International Peace, Washington 6, D.C. Pp. 287. Price $2.50.

In view of the decision of the United Nations to convene in San Francisco on April 25 to consider the Dumbarton Oaks proposals for international peace and security, this volume is a timely contribution by a distinquished international jurist. It is not a treatise for experts, but rather "a guide for the statesman and the intelligent but perplexed layman." It summarizes the past experience with international tribunals and pacific settlement of international disputes, and seeks to apply the lessons of that experience to current world problems. For the immediate future the author believes that the Permanent Court of International Justice—"the supreme achievement of the twentieth-century effort"—should be preserved. It functioned with surprising success from 1922 to 1940, and can be reanimated when peace is restored. The older Permanent Court of Arbitration should also be preserved as a useful agency for the future.

## PUBLICATIONS RECEIVED

**U. S. Geological Survey, Washington 25, D.C., has issued the following publications available free on application, except as indicated.**

"Reconnaissance of Porcupine Valley, Alaska," by Gerald Fitzgerald. Bull. 933-D. For sale by Superintendent of Documents, Government Printing Office, Washington 25, D.C. Price 45c.

"Cobalt-Bearing Manganese Deposits of Alabama, Georgia, and Tennessee." By W. G. Pierce. For sale by Superintendent of Documents, Government Printing Office, Washington 25, D.C. Price 20c.

"Phosphate Deposits of the Teton Basin Area, Idaho, and Wyoming." By Louis S. Gardner. Bull. 944-A. For sale by Superintendent of Documents, Government Printing Office, Washington 25, D.C. (No price given.)

"Geology and Lead-Zinc Deposits of the Royal John Area, Swartz District, Grant County, New Mexico." Available for consultation in the office files of the Survey, Washington 25, D.C., and Rolla, Mo.; also at the Bureau of Mines, Silver City, New Mexico.

"Beryl Pegmatites of the Ruby Mountains, Nevada." Map by D. J. Fisher.

**U. S. Bureau of Mines, Washington 25, D.C., has issued the following publications, obtainable free on application, except as indicated.**

"Electrical Devices Applied to Metallurgical Research." By E. V. Potter. Obtainable from Superintendent of Documents, Government Printing Office, Washington 2, D.C. Price 10c.

"Diatomites of the Pacfic Northwest as Filter-Aids." By Kenneth G. Skinner. Bull. 460. Obtainable from Superintendent of Documents, Government Printing Office, Washington 25, D.C. Price 25c.

"Bureau of Mines Exploration of Mercury Deposits to June 30, 1944." By McHenry Mosier. I.C. 7299.

"Prevention of Fires Caused by Electric Arcs and Sparks From Trolley Wires." By F. E. Griffith, E. J. Gleim, R. T. Artz, and D. Harrington. I.C. 7302.

"Geophysical Abstracts 118, July-September 1944." Compiled by W. Ayvazoglou and V. Skitsky. I.C. 7303.

"Studies of the Effect of Humidity on the Sensitivity and Dispersion of Black Powder." By Raymond H. Moore with Wilbert J. Huff. R.I. 3782.

"Colorimetric Determination of Low Concentrations of Carbon Monoxide by Use of a Palladium Chloride-Phosphomolybdic and Acid-acetone Reagents," By R. D. Polis, L. B. Berger, and H. H. Schrenk. R.I. 3785.

"Spot Test for the Separation of Aluminum Bronze from Manganese Bronze." By R. B. Corbett. R.I. 3786.

"Milling and Smelting Operations of the Magma Copper Co., Superior, Ariz." By Edward J. Caldwell. I.C. 7300.

"Successful Method for Signaling from Mine Cages at Rest or in Motion." By Carl Belser. I.C. 7305.

"Filter-Paper Method for Obtaining Dust-Concentration Results Comparable to Impinger Results." By Carlton E. Brown. R.I. 3788.

# EXIDE POWER IS *SUSTAINED* POWER

ALL OUT FOR THE MIGHTY 7th WAR LOAN

When Exide Batteries supply the motive power, locomotives and trammers keep pulling strong, steadily, and straight through to the end of the day . . . helping to boost tonnage to an all-time high . . . helping to cut haulage costs to an all-time low.

Exide Batteries have the high voltage needed for prompt starting, fast acceleration, and uniform performance all day long. That's why you hear of so many Exide-powered haulage units in today's mines, quarries and tunnel operations. And wherever Exides are in use, they are serving with dependability, long-life and ease of maintenance.

If you wish more detailed information, or have a special battery problem, don't hesitate to write to Exide. We want you to profit from the long-life built into every Exide Battery. Ask for booklet Form 1982.

ARMY E NAVY

Exide
BATTERIES

THE ELECTRIC STORAGE BATTERY COMPANY, Philadelphia 32 • Exide Batteries of Canada, Limited, Toronto

# PERSONAL NEWS

**Harry Green** has retired from the staff of Metals Reserve Co. to return to his former position of treasurer of Brandeis, Goldschmidt & Co., of New York City.

**Floyd W. Erickson,** formerly efficiency and safety engineer with Andes Copper Mining Co., is now with Cia. Minera Unificada del Cerro de Potosi, Bolivia.

**U. H. Berthier** has assumed the management of the Torreon smelter of Cia. Metalurgica Peñoles at Torreon, Coahuila, Mexico, his address being Apartado 93.

**Francis B. Speaker,** with the Mining Division of the War Production Board for more than two years, has joined the Hewitt Rubber Co. as Western field engineer.

**Olaf P. Jenkins,** chief geologist with California State Division of Mines, has been made chairman of the Reconstruction and Reemployment Commission's aerial mapping committee at Sacramento, Calif.

**J. R. Sendon,** recently mineral specialist with the Foreign Economic Administration in Washington, has become general superintendent of the Peru-Molibdeno Co. His address is Casilla 1847, Lima, Peru.

**J. S. Coupal** has established an office for consulting work at Room 307, Home Builders Bldg., Phoenix, Ariz.

**J. B. Haffner,** general manager of Bunker Hill & Sullivan Mining & Concentrating Co., recently made a gift of $10,000 to Stanford University, in California, in commemoration of his son, John M. Haffner, who died in the service of his country.

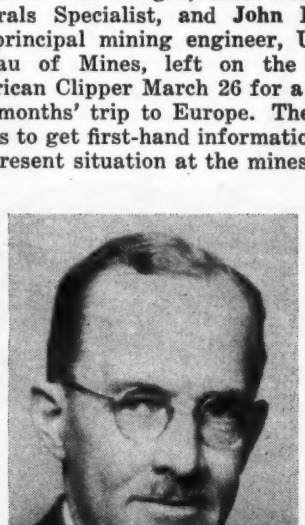
**Henry P. Ehrlinger,** until recently a lieutenant colonel in the Army Engineers' Corps, has returned to civilian employment as assistant superintendent of the Shenandoah-Dives Mining Co. His address is Box 211, Silverton, Colo.

**Bert D. Harden,** recently reduction works superintendent for Basic Magnesium, Inc., has joined Chemical Construction Corporation as general superintendent of the company's alumina plant at Salem, Ariz.

**Philip D. Wilson,** special assistant to the chairman of the WPB and until recently vice president for metals and minerals, has resigned to become assistant to the president of Baker & Co., Inc., of New York.

**Perry N. Taylor** has been appointed superintendent of High Peak mine, at Inyokern, Calif.

**Charles Will Wright,** Chief Foreign Minerals Specialist, and **John East, Jr.,** principal mining engineer, U. S. Bureau of Mines, left on the Pan American Clipper March 26 for a several months' trip to Europe. The object is to get first-hand information on the present situation at the mines and



CHARLES WILL WRIGHT

plants and their capacity to produce the needed mineral products in the war effort; in particular coal, lead, antimony, and mercury. They will first visit Spain, then France, Belgium, Italy, the Balkans, and England. On this trip Mr. Wright will reestablish his contacts with the local Departments of Mines in these countries for the exchange of statistical and technical information with the U. S. Bureau of Mines.

**John C. Davey,** consulting mining engineer, attached to the Ministerio de Fomento, of the Venezuelan government, has been appointed to a committee of three to prepare a syllabus for a four years' mining engineering course in the School of Engineering of the Central University, Caracas. It is proposed to open the course in mining engineering in September of this year and it is expected that there will be a good enrollment.

**Guy F. Rolland** has been appointed Director of Reynolds Experimental Laboratory, the explosives research facilities of Atlas Powder Co. near Tamaqua, Pa.

**Jack S. Hamilton** has assumed the superintendency of the custom lead-zinc mill of Shattuck Denn Mining Corporation, of Bisbee. Mr. Hamilton succeeds **Howard Hendricks,** recently promoted to chief metallurgist of Shattuck Denn's Arizona milling operations.

**Ira B. Joralemon,** consulting mining geologist, San Francisco, Calif., has been appointed a director of Homestake Mining Co., filling the vacancy caused by the death of Harold Kingsmill.

**William W. Adams,** Bureau of Mines authority on accident statistics, who advanced from junior clerk to head of the division he helped institute 34 years ago, retired on Feb. 28, 1945, as chief of the Bureau's Accident Analysis Division. Mr. Adams has been in Federal service 38 years, the last 34 continuously with the Bureau of Mines.

**M. M. O'Brien,** vice president and managing director of Bralorne Mines, Ltd., has been elected president of Taylor (Bridge River) Mines, Ltd. Other Bralorne officials elected to the Taylor company's Board include **Ronald H. Grace,** secretary, and **Don N. Matheson,** director. **J. M. Taylor** and **E. L. Boultbee,** of the original Board, remain in office.

**Dr. Zay Jeffries,** vice president of the General Electric Co., Pittsfield, Mass., was recently awarded the Clamer Medal of the Franklin Institute of Philadelphia, "for his meritorious contributions to the science of metals, which he has placed on a new and more intelligible basis."

**L. C. Graton,** professor of mining geology at Harvard University, has been elected a director of Cerro de Pasco Copper Corporation. He succeeds the late Harold Kingsmill.

**James H. McGraw, Jr.,** president of McGraw-Hill Publishing Co., was on April 22 awarded the honorary degree of doctor of engineering by Rensselaer Polytechnic Institute, Troy N. Y. He delivered the commencement address at the graduation exercises.

**Hugh Leach** has resigned as district superintendent of mines on Cuyuna iron range for the Evergreen Mines Co., to join the operating staff of Cleveland-Cliffs Iron Co. on the Mesabi Range.

**Donald J. Reese,** of the Steel Division of WPB since 1942, has again become associated with the Development and Research Division of International Nickel Co. at New York.

**W. R. Robertson** has resigned his position as general manager of the National Mining & Milling Co., in Arizona, and plans to establish himself in northern California and Nevada, where he will follow consulting work.

**L. K. Brindley** was recently elected president of Falconbridge Nickel

Mines, Ltd., being advanced from vice president of the company. He has been connected with the company since its organization.

Dr. Víctor M. López, Director of the Venezuelan Government's Mining and Geological Service, has been decorated by the government of Haiti with the Order of Petión-Bolívar in recognition of the valuable services he recently rendered it. That these services were of a high order may be gauged by the fact that this decoration has been awarded to only eight other persons.

A. Allan Mackay, who has extensive interests in Canadian mining enterprises, has resigned from his business and professional associations to accept the post of Coordinator of Resources and Development in the Ministry of Reconstruction of the Dominion of Canada.

Edward Sullivan, who before joining the armed forces was in the engineering department of Pickands, Mather & Co., has since March 1944 been a prisoner of war in Germany. He was navigator of a bomber grounded on German territory.

R. C. Fish, formerly general superintendent of Minnesota operations for the M. A. Hanna Co., has been made assistant general manager of all the company's iron ore properties. R. W. Whitney, general superintendent of Butler Brothers' operations for the past nine years, has been made general superintendent of all Minnesota operations for the M. A. Hanna Co.

V. E. Frank, until recently in Brazil with Cia. Vale do Dio Doce, has become a member of the staff of Castle Dome Copper Co., of Miami, Ariz.

Gordon D. Strachan, former superintendent of Big Wedge mine of the Atok Gold Mining Co., Baguio, P. I., has been rescued, with his wife and child, from a Japanese prison camp by our armed forces. All are reported in good health.

Butler Brothers, iron ore miners of St. Paul and Cooley, Minn., announce the following promotions: Earl S. Mollard, general superintendent, replacing R. W. Whitney, resigned; C. E. McManus, superintendent at Cooley; H. I. Reese, superintendent at Hibbing; and B. M. Andreas, chief engineer at Cooley. Mr. Mollard has been with Butler Brothers for more than 23 years. For a number of years he was superintendent of the company's mines on the Cuyuna Range.

Norman A. Morton has returned to the research department of the Hudson Bay Mining & Smelting Co., at Flin Flon, Man., following his medical discharge from the Royal Canadian Engineers.

Hugh R. Van Wagenen has returned to the United States from Africa after

4 REASONS WHY MINES SPECIFY SCHRAMM AIR COMPRESSORS

1 100 PER CENT WATERCOOLED
2 COMPACT—LIGHTWEIGHT
3 MECHANICAL INTAKE VALVE
4 FORCED FEED LUBRICATION

There are many compressed air jobs to be done by Coal Mines, and into this versatile picture fits the Schramm Air Compressor. Its features enable compressed air jobs to be done quickly—easily—economically!

Illustrated here is a drilling job, one of many applications for Schramm Compressors. They are designed for heavy duty, continuous service, with minimum attention.

Schramms are built in sizes ranging from 20 to 600 cu. ft. displacement in every type of mounting and assembly. Start your compressor planning by writing for detailed literature and features of Schramm Compressors, both stationary and portable.

SCHRAMM INC. THE COMPRESSOR PEOPLE WEST CHESTER PENNSYLVANIA

a fifteen months' trip through the western and southern parts of the continent for the Foreign Economic Administration. He will be at Washington for a few weeks before undertaking new activities.

**H. C. Slagle**, McElwaine, Ark., works manager of Alcoa's Lake Catherine plant since January 1942, has been transferred to New Castle, Pennsylvania, and will be succeeded at Lake Catherine by **J. B. Holmes** formerly at Burlington, New Jersey.

**G. J. Williams** recently departed from the Gold Coast for New Zealand, to assume the post of director of the School of Mines at Otago.

**Dr. E. A. Cameron** was on April 17 elected president of the Canadian Institute of Mining and Metallurgy at the Institute convention held at Quebec City. He succeeded **A. A. MacKay**. The last general session was held in 1942.

**B. A. Gould**, mining engineer on the staff of H. W. Gould & Co., of San Francisco, has returned to company headquarters from a professional trip to Honduras.

**A. M. Banks**, of Nelson, B. C., has been elected president of the Chamber of Mines of Eastern British Columbia, succeeding **Harold Lakes**.

**S. S. Clarke**, of Baxter Springs, general mine superintendent for the Eagle-Picher Co. in the Tri-State, has been appointed vice chairman of the room-and-pillar section of the mining methods committee, American Institute of Mining and Metallurgical Engineers.

**J. C. Stipe**, of St. Louis, a service engineer for Ingersoll-Rand Co., has been named as Tri-State district representative of the company, succeeding the late Charles L. Larson, of Baxter Springs, who died last Jan. 7. Stipe is a graduate of the Colorado school of mines.

**A. J. Arland** has been placed in charge of exploration at the Dentonia mine, Greenwood, Minn. He has recently been discharged from the R.C.A.F.

**Arvid Thunaes**, metallurgist at the Sullivan mill, has returned to Kimberley after a two-year period in Bolivia, where he was engaged in tin recovery.

**Max Tessmer**, recently directing underground and shaft-sinking operations in the limestone mines of the Pittsburgh Plate Glass Co., in Barberton, Ohio, has been appointed mining engineer for International Talc Co., Inc., at Gouverneur, N. Y.

**Frank A. Wardlar, Jr.**, has been elected president of Utah Metal Mine Operators Association. He is manager of International Smelting & Refining Co. and succeeds **D. D. Moffat**, president and general manager of Utah Copper.

**Samuel Baker**, of Scranton, Pa., has been elected president of the Pennsylvania Society of Professional Engineers and **Robert G. Pfahler**, of Winber, Pa., reelected vice president.

**Frank St. Vincent** has accepted a position as metallurgist for the Vanadium Corporation of America at the company's Niagara Falls, N. Y., plant.

**B. R. Coil** has been appointed general superintendent of both Miami Copper Co. and Castle Dome Copper Co., in the Globe-Miami district.

**A. H. Bebee**, general manager of Carlton interests in Cripple Creek, Colo., has been appointed a director of the Colorado Metal Mining Fund by Governor Vivian of that state.

**Andrew K. McCosh**, president of the Mining Association of Great Britain, was recently elected president of the British Employers Confederation.

**H. J. R. Way** has been appointed chief geologist in the New Geological Survey Department of Swaziland.

**Horacio A. Bruna** has joined the engineering staff of Cerro de Pasco Copper Corporation at Casapalca, Peru.

**Wilbert E. Warnke**, metallurgical engineer on the staff of the U. S. Bureau of Mines, has been transferred from Rolla, Mo., to Minneapolis.

**Maynard H. Van Ornum** has resigned his position with the U. S. Bureau of Mines, to accept the post of mine engineer for the U. S. Gypsum Co. at Plasterco, Va.

**Hugo Vasquez-Rosas**, mill superintendent for Minas de Cercapuquio, in Huancayo, Peru, who has been studying for a year at Pennsylvania State College, and received his master's degree in mining engineering in October, 1944, plans to return soon to Peru to resume his position with Cercapuquio mines, the address of which is Box 9, Huancayo, Peru, South America.

**Charles White Merrill**, formerly supervising engineer of the San Francisco office of the Metal Economics Division of the Bureau of Mines, is now chief of the division, with headquarters in Washington, D. C.

**L. F. Gauvreau** has arrived at Yellowknife, N.W.T., Canada, where he will represent Mining Research Corporation as resident engineer.

**Lieut. Col. Gustave H. Rainville**, a veteran of the first World War, has retired from active duty in the Canadian Army and has resumed his former business activities.

## OBITUARIES

**Charles R. Alaniva**, formerly associated with iron mining on the Mesabi Range, died at Jackson, Fla., recently.

**William B. Deneen**, 61, Bakersville, N. C., miner, died suddenly April 13 while inspecting a feldspar mine near Penland, N. C.

**James H. Williams**, Nashwauk, Minn., assistant general superintendent of mines for the Wisconsin Steel Mines of the International Harvester Co., died on March 22 at the age of 57.

**Moses H. Lyon**, retired mining engineer of Roselle, N. J., died on April 24 at the age of 89.

**Herbert S. Auerbach**, 62, metallurgical engineer and industrialist, died March 19 in Salt Lake City.

**Newton A. Dunyon**, 79, mining engineer and operator, died March 18 in Salt Lake City.

**Joseph William Hyland**, 80, associated with the western mining industry since 1893, died March 23 in Salt Lake City.

**William Ernest Thomas**, 60, engineer with the National Tunnel & Mines Co., Tooele, Utah, died March 19 in Salt Lake City.

**Patrick J. Fennell**, 78, former state senator, merchant and mining man, died April 9 at his home, Eureka, Utah.

**Halstead Lindsley**, president of Sherritt Gordon Mines and Coniarum Mines, vice president and director of Nichipicoten Iron Mines, and Ventures Limited, and on the board of several other mining companies, died in New York recently.

**Edward H. Burdick**, 67, mining engineer and geologist for Western metal mining concerns for many years died April 6 in Salt Lake City.

**Arnold C. Matthews**, a director of Kirkland Lake Gold Mining Co. and Northern Canada Mines, died in Toronto on March 25.

**Charles B. Kirch**, mining engineer and geologist of Pasadena, Calif., died on March 22 last at the age of 36. He was a graduate of the Colorado School of Mines and was employed as a geologist in the United States Engineers' Office in Los Angeles.

**Ellery Anderson**, 55, superintendent of Virginia mine of Snyder Mining Co., Eveleth, Minn., died on April 21.

**Walter F. Larssen**, 67, prominent mining operator of Arizona, died on April 1 in Phoenix, in that state.

**Robert Knox Paton**, M. C., a resident of Vancouver for the past 23 years, died March 25. He was born in Glasgow and was a member of the

Institution of Mining and Metallurgy and of the Association of Professional Engineers of British Columbia.

**Robert Marsh, Jr.**, retired mining engineer, died in Tucson, Ariz., on March 18 at the age of 62. He was an alumnus of Cornell and Columbia and had been associated with the Guggenheim and many other important mining interests.

**Jack Littleford**, concentrator superintendent of Roan Antelope Copper Mines, Ltd., Luanshya, northern Rhodesia, since 1931, died on March 24, 1945, after a short illness.

**William Thorn**, 84, a retired mining engineer of Placerville, Calif., died in that city on April 9.

**H. E. Jefferson**, Calumet & Hecla Consolidated mining engineer, died on March 14.

**Joseph H. Harris**, 51, mine superintendent for the Miami Copper Co. at Miami, Ariz., died on April 1st. Mr. Harris had been continuously connected with Miami Copper Company since 1915.

## An Appreciation of Robert Hallowell Richards

Robert Hallowell Richards, who passed away peacefully on March 27, 1945, in his 101st year, not only saw the progress of a century unfold, but he took an active part in many developments and made significant contributions to that progress. This brief memorial can give only an inadequate account of the man and his accomplishments. Born in Gardiner, Me., on Aug. 26, 1844, his forebears were of the traditional old families of the Pine Tree State with a still earlier heritage of English ancestry. His early education in England by tutors and at schools and in the United States along the classical academy line was getting him nowhere when he entered with the first class at the Massachusetts Institute of Technology in February, 1865. Here he found himself, and this was the real turning point in his career. He graduated in mining in December, 1868, and immediately went on the staff, where for the next four years he taught chemistry, assaying and mineralogy. In 1873 he was made professor of mining in charge of the department and director of the mining and metallurgical laboratories. He and his students working with him developed these laboratories, the first of their kind in the United States. Then followed 41 years of active teaching until his retirement as Professor Emeritus in 1914 at the age of seventy. He thus had the unique distinction of being the only person who ever had continuous connection with the school from its beginning down to the present time. However, his retirement from teaching meant no letup in his busy life but merely time and opportunity to carry on in other


SHORT DISTANCE

TO THE ANSWER ON POWER TRANSMISSION PROBLEMS

PROSPECT 0874, ST. LOUIS, is a call for Medart's 60 years of engineering experience in power transmission. Unbiased recommendations because Medart engineers can choose from the entire field of power transmission to fit your needs. Efficient trouble-free service because the *planning* and *execution* are from one single, reliable source!

*"Patents make Jobs"*

- Shaft Hangers
- Bicycle Type Sheaves
- V-Belt Drives
- Cast Iron Pulleys
- Steel Rim Pulleys
- Ring Oiling Bearings
- Wick Oiling Bearings
- Belt Tighteners
- Chain Drives
- Set Collars
- Hercules Pulleys
- Wood Pulleys
- Shafting
- Friction Clutches
- Sprockets
- Pattern Work
- Rigid Shaft Couplings
- Flexible Shaft Couplings
- Universal Shaft Couplings
- Medart-Timken-Bearings
- Iron & Semi-Steel Castings
- Wire Rope Sheaves
- Cut Tooth Gearing
- Molded Tooth Gearing

MANUFACTURING ENGINEERS OF COMPLETE TRANSMISSION EQUIPMENT AND SPECIALIZED MACHINERY

MEDART

THE MEDART COMPANY • 3500 DE KALB ST. ST. LOUIS, MO.

lines. He remarked one day that he was actually busier after his retirement than he had been before. He had twice visited Europe back in the seventies to see mining and milling methods and to study the systems of engineering education. He went unaccompanied to Japan in 1929, at the age of 85, to attend the World Engineering Congress, where he was royally entertained by his old student, Baron Takuma Dan. He wrote his autobiography, which appeared under the title of "Robert Hallowell Richards—His Mark," in 1936.

His underlying principle was to learn by doing, and this he inculcated into his pupils. In his laboratories he adopted a middle course in avoiding on the one hand full-size apparatus which would involve much physical effort in handling large amounts of material and on the other hand machines so small as to be only toys which would not give students any conception of commercial operations. He always worked with his students, instructing them by precept and example. It is significant that throughout the several hundred letters coming to him from his former students on the occasion of his 100th birthday little mention was made of the professional teachings of Professor Richards, which perhaps many of these had forgotten, but over and over incidents were remembered of his kindness and understanding help with their personal problems and the wise advice which he gave them.

To understand fully the personality and mentality of the man one would have had to know him personally. He was in no sense a brilliant genius, but his mind was always busy. He had to see things for himself. He was never ruled by precedent. Advance speculation and theorizing were out. His rule was to follow four systematic steps: (1) Observe, (2) Record, (3) Collate, (4) Conclude. He was always observant. Whatever phenomenon, whether usual or unusual, which might be observed by an average person and dismissed without further thought, was taken into his mind and given thorough analysis and study from every viewpoint to bring out final conclusions of cause and effect. His mental processes were not rapid, but they were extremely thorough, and the results are shown by his work and inventions and writings, not only in his special field of education and ore dressing, but also in various other broadly divergent fields.

How the man worked can best be illustrated by the story of his classical four volumes of Ore Dressing. In 1893 Richard P. Rothwell, who was the editor of the *Engineering and Mining Journal*, proposed that Professor Richards write a book on Ore Dressing, which he estimated could be finished in four months. Professor Richards thought he could do it in three years, and immediately started. He soon became dissatisfied with the lack of information available, and especially lack of personal knowledge from actual observation of what were the latest developments in milling. Consequently in 1895 he engaged an assistant, and they spent the entire summer visiting mills and collecting data all over the country. It became a tremendous job to obtain complete data, tabulate it all, and write the book, so that it was not until 1903 that the two-volume opus appeared. Then there had been so many new developments that Professor Richards started to write an appendix, which ultimately became two additional volumes, three and four. This shows the thoroughness of the man.

By nature he was most kindly, and people young and old were attracted to him. If he started off on a tour in a party where many were strangers he soon became intimate with them through his ever-present camera or by pointing out to them the many things of interest to be seen all around them.

Many honors came to him in recognition of his fame as an educator and a scientist. He was a member of many organizations and societies. He was president of the American Institute of Mining and Metallurgical Engineers in 1886 and was made honorary member in 1911. He was also made honorary member of the Chemical, Metallurgical and Mining Society of South Africa, the Canadian Institute of Mining and Metallurgy, and the Mining and Metallurgical Society of America. The last-named organization awarded him its gold medal in 1915. He was also the recipient of the degree of LL.D. from the University of Missouri in 1908.

CHARLES E. LOCKE.

# LETTERS

## A Message From the Philippines

*The Editor:*

As you may have heard, we were among the civilians rescued from Japanese internment camps in the Philippines. As to our treatment by our captors, I can add little or nothing to the many accounts published in your papers and magazines. We were persecuted, starved, and some of us killed, but thank Heaven that is all over now, and since the 3d of February we have been free.

Fortunately, the Sto. Tomas University Library contained a complete file of your magazines, and these were used by the many engineers in the camp for lectures, papers, and discussions.

Due to the wholesale destruction of the city by the Japanese, I look for a tremendous reconstruction program during the next few years. The American Army has already made a wonderful start in clearing debris, rock, and rubble from the streets, starting repairs to roads and bridges throughout the city, and, in the words of one observer, has made far greater progress in three weeks than the Japanese did in three years.

When normal mail service is again resumed, it will be a pleasure once more to receive your magazines.

CHARLES A. MITKE.
*%American Chamber of Commerce*
*Manila, P. I.*

## On Gold, Prosperity and Wealth

*The Editor:*

SEVERAL LETTERS advocating silver to supplement gold as a medium of exchange in foreign trade have appeared in *Engineering & Mining Journal* and other publications. The writers predict a shortage of gold, and therefore propose the use of both silver and gold for monetary purposes. It is admitted that there cannot be two independent standards of value; therefore it is proposed to establish a fixed price for silver in terms of gold. Gold and silver are commodities. Their value is determined by the supply and demand for the labor required to produce them, and this value cannot be determined by legislation. But when the price of gold in dollars is fixed by law, the value and buying power of the *dollar* in terms of human labor is established. This value cannot be preserved unless the dollar actually is exchangeable for gold at the legal price. To make use of both gold and silver for monetary purposes, both dollars and gold must be exchangeable for silver at the price established for each, and the plan would not be workable. If the world supply of silver increased abnormally, it would all be exchanged for gold and there would be nothing but silver to exchange for the dollar.

The truth of this is proved by history. For a hundred years previous to 1930 a $20 bill could be exchanged for a $20 gold piece weighing nearly an ounce, and the British pound was worth $4.86. The great demand for labor during the first World War caused wages and prices to rise. By 1930 the extra buying power of money borrowed for war purposes had been spent, and wages and prices should have dropped back to prewar levels, as they have always done before, in order to restore the buying power of incomes from invested capital. Instead, because lowering wages is a painful process and unpopular, the dollar was depreciated to $35 for an ounce of gold, and the value of the British pound was lowered until it was again worth $4.86. Since then the U. S. Treasury has bought all gold offered for sale at $35 an ounce, and has paid adverse trade balances at that figure, but it has not exchanged gold for currency in the United States. To preserve the value of the British pound it has been the policy of the Bank of

(*Continued on page* 160)

## Canadian Institute's Quebec Meeting

(*Continued from page* 108)

topic being, in the main, the important iron deposits in Labrador and the adjacent portion of Quebec, though the general geology and other mineral discoveries were also discussed. Good photographs and motion pictures added to the interest. The belt of iron-bearing rocks is 40 to 50 miles wide and 350 miles long. Of the 9 deposits discovered thus far in Quebec and the 15 deposits in Labrador, the most outstanding is at Sawyer Lake, which was diamond drilled last season, the deepest hole being 220 ft. Analysis of samples showed 68.4 percent iron on the average with low phosphorus, silica, and sulphur. Ore exposed on surface here indicated a minimum tonnage of 30,000 per foot of depth. Average of surface samples from all deposits showed 62 to 63 percent iron. Ample water power for mining could be developed at Grand Falls, 90 miles from the Sawyer Lake deposit. Transportation problems can be solved by building a 250-mile railway from the Gulf of St. Lawrence up the Romaine River valley. The Labrador company is controlled by Hollinger Consolidated Gold Mines, with M. A. Hanna Co. participating. John Knox is general manager.

Concluding the meeting was a discussion of recent trends in labor legislation by J. C. Cameron, of Queens University, who demonstrated that an adequate solution of the collective bargaining problem is a public issue of first importance.

He said: "If governments in Canada see fit to establish collective bargaining on a sound foundation, they might find it unnecessary to do anything about the closed shop itself. If they set up adequate machinery for collective bargaining and for the conclusion of collective agreements, the union security issue might seem less urgent to unions and employers alike. For in many cases unions must be demanding closed shops in the fear that compulsory collective bargaining will eventually disappear. . . ."

The annual dinner was the scene of an eloquent and inspiring talk on the Quebec viewpoint by the Hon. Maurice L. Duplessis, Prime Minister of the province. Dr. Alan M. Bateman, of the Foreign Economic Administration, Washington, D. C., who followed, had as his subject "The Outlook for Base Metals." The various annual awards of the Institute were made, Stadacona Mines, at Rouyn, Que., receiving the John T. Ryan trophy for the best safety record in the Dominion; International Nickel's Frood mine for the best record in Ontario; Sherritt-Gordon Mines for the best record in the Prairie Provinces and the Northwest Territories; and Silbak Premier Mines for that in British Columbia and the Yukon.

Intense heat, high pressures, violent agitation cause weaker molecules in oil to break down—become susceptible to oxidation and polymerization—form gums, resins, asphaltenes. When this happens, oil becomes tired . . . unable to do its vital job.

Result—piston lacquering, bearing failures, premature engine wear, increased upkeep and excessive oil consumption.

Briggs Oil Clarifiers prevent the disastrous results of tired oil. They remove the visible contaminants in oil . . . dust, metal chips and grit. They remove the invisible products of oxidation . . . gums, resins, asphaltenes. Oil clarified in a Briggs Clarifier does a better job longer, maintenance is lowered, trouble is prevented.

Ask the Briggs Distributor in your locality for the facts about the advantages of continuous maintenance of lube oil, the importance of clean Diesel fuel oil. He will show you how and why Briggs Clarification goes far beyond ordinary filtration.

There is a Briggs Oil Clarifier for every size and type internal combustion engine . . . for every type of oil . . . for practically every purpose.

***Consult Briggs FIRST on any filtration problem.***

ARMY E NAVY

**Briggs**

**BRIGGS CLARIFIER CO.** PIONEERS IN MODERN OIL FILTRATION **Washington 7, D. C.**

Representatives in Principal Cities—listed in the "Filter" section of most classified telephone directories

# The Rape of Manila

Few Americans realize the horror of the days when Manila was being liberated; how the Japanese, acting under orders, flouted all the ordinary conventions of warfare and went berserk. To afford a glimpse of these turbulent days we quote below from letters of American civilians who were confined at Santo Tomas (University) Internment Camp.

As reported in our April issue (p. 128) A. F. Duggleby, vice president and general manager of the Benquet and Balatoc companies, was executed by the Japs in January. During the liberation, Q. A. Abadilla, director of the Philippine Bureau of Mines, was killed by a shell striking his house.

The first quotation is from a letter of C. V. Schelke, general manager of General Electric Co. (P. I.) Inc. The second is by Mrs. Charles A. Mitke. On page 116 is a letter to the Editor from Mr. Mitke, consulting mining engineer and consultant to Metals Reserve Co.

"We are still unable to understand just how we happen to be alive. Our main problem during internment was to get enough to eat. At the end when our diet dropped to some 700 calories per day, the food being practically devoid of vitamins, fats, and proteins, many in our midst died of starvation. A few were executed, and a number were killed at the end when the Japanese turned their guns on the civilians in this internment camp as the First Cavalry was administering the coup de grace in the city of Manila.

The final efforts of these mad Orientals to destroy all the life and property in Manila is something that beggars description. Weeks before our troops arrived, they systematically dynamited and burned almost everything of value in the city, and at the end, when they realized they were trapped, some twenty to thirty thousand Japanese marines went on an orgy of killing that exceeds as an evidence of their bestiality even the Nanking incident. I recently talked to an officer who had personal experience with the bombings at Coventry, London, Barcelona, Naples, and Bizerte, and he assures me that nothing which transpired in those places even remotely compares with the destruction of life and property which took place in Manila. This whole city will have to be leveled and rebuilt, with the exception of a very few residential districts, and it probably won't be a very pleasant place in which to live for many years."

"Three weeks ago last night the First Cavalry, mechanized, rolled into Manila in their big tanks and rescued the internees of Sto. Tomas just in the nick of time. There were only 800 of them at the start, and had the Japs realized it, I think we would have had a tough time, but others came in before morning, and three or four other divisions soon showed up. The boys told us when they came in that General MacArthur had told them not to spare their motors, but to get here at all costs as soon as possible. The Army had got wind of the fact that the Japs planned to do away with us as soon as the Americans reached within a certain distance of Manila, and, as one boy said, 'They didn't know what they would find. They were ready for anything.' We heard the Filipinos cheering as the tanks came on to Rizal Avenue, from the North Road, about four or five blocks away from the real wall of our compound, and we heard intermittent firing. Someone said, 'There is street fighting. Evidently the guerrillas couldn't contain themselves any longer, and have started the battle of Manila ahead of the Army.' Then the sounds died away, and there were big fires blazing in the distance. This didn't disturb us particularly, the Japs had been destroying buildings and munition dumps for several weeks. Then, from the front gate came a noise, and a big searchlight was focused on the building. It was a very dark night, but out of the gloom loomed up something elephantine in appearance, and an American voice was heard saying, 'Yes, it's all right.' Then the camp went wild. Two of the boys came in, struggled up the stairs and said 'You're all free.' but nobody could hear them. They were mobbed by the girls who wanted to kiss them, and by the men who wanted to shake their hands.

### Ten Last Days of Hell

"The Japs hadn't had time to get away. Several were shot at the gate as the boys came in, the rest holed up in one of the several camp buildings. Our boys machine-gunned it to try and smoke them out, but the Japs lined up the Americans who lived in that particular building along the front widows, and fired over their shoulders. This made it impossible to continue the fight without wounding internees, and the fight was called off until morning. Meanwhile, snipers on the roofs of our buildings and in the shrubbery around the grounds were wounding soldiers and civilians alike. Next day a deal was made with the Japanese. We agreed to give them safe conduct, with their arms, to the outskirts of the city, in return for the lives of our people, and this was done early Monday morning. Later, that same day, two of them were caught sniping around the walls.

"Fighting went on around us for about ten days. Wednesday, after the boys came in, the Japanese big guns found our range and played havoc with the buildings and the camp generally. We had a really dreadful time. Many direct hits found their mark, and we lost a number of our people. Five were killed instantly, and two lost their arms, in a dormitory I had walked out of just five minutes before. Nearly half the three-story building was rendered untenable and dangerous, while the women occupying the remaining rooms on the ground floor voluntarily relinquished them for use as emergency hospitals for the dying and wounded. We slept in chairs or on the concrete floors for three or four nights. Some of us never had our clothes off for from 48 to 72 hours. There was so little room, as everyone crowded into what was considered the safest section of the building. Glass, mortar, and concrete flew in every direction as the shells exploded. The water ceased flowing in the mains and had to be carried in buckets long distances. Only one toilet room was considered safe, and over 2,000 men and women were trying to use it. There was no electricity, and we didn't dare show a light anywhere at night. Conditions were indescribable. Bombing, shelling, machine-gun fire, rifle fire kept up incessantly. I can understand now why men get shell-shocked. I thought I was myself, for a time. One by one our men found the Japanese big guns and silenced them, but just when we would think we were safe, over would come a shell and hit the building somewhere. Nobody has to tell us now what it was like in Stalingrad when the city was taken by the Russians, section by section. We know from first-hand information.

"Gradually the battle moved away from our section, and centered on the area west of the Pasig River—Malate, Passay, Erminta, and the old Walled City and harbor area—but we were in the line of fire and the American big guns kept firing over our heads and the whoosh of big guns and shells as they carried death and destruction to the Japanese resounded in our ears and re-echoed around the walls of the inside patios, where we congregated when it was not safe to go outside. Many nights it was impossible to sleep on account of the noise of the firing.

"Prior to the arrival of our boys, the Japanese were slowly and systematically starving us to death. It was a sort of slow torture, dying of

(*Continued on page* 160)

**SURE, WILLIE CAN SPELL** b-u-t-a-d-i-e-n-e

And chances are he'll tell you it's converted from petroleum into one of the primary ingredients of most synthetic rubber . . . for his juvenile curiosity knows no bounds.

Neither does the scientific curiosity of Hewitt's rubber engineers. That curiosity led to the development, way back in 1931—fourteen years ago—of SYNTHETIC rubber compounds for certain needs . . . such as oil and gasoline hose . . . where natural, tree-grown rubber just would not hold up.

YOU profit by Hewitt's *fourteen years* of experience with not one, but *many* different types of synthetic rubber. It is your "best bet" that Hewitt products will *do* your job . . . do it BETTER . . . do it LONGER . . . COST LESS per working hour.

★ ★ ★

**Specify "Hewitt" for quality industrial rubber products. Phone the Hewitt distributor listed in the Classified Section of your telephone directory . . . or write Hewitt Rubber Corporation, 240 Kensington Avenue, Buffalo 5, New York.**

**HEWITT RUBBER** *of Buffalo*

Job-Engineered Industrial Hose • Belts • Molded Goods

QUALITY RUBBER PRODUCTS FOR INDUSTRY FOR 85 YEARS

# REGIONAL NEWS

## UTAH

### Federal court holds illegal the taxation of premium payments on metal production

★Refusal by the Non-ferrous Metals Commission to permit a joint management-labor request to pay "ride" money to employees caused a walkout March 22 of approximately 180 underground and surface employees of New Park Mining Co. at Keetley. The men remained away from work two shifts because of the refusal. Funds given by the mining company to the management-labor committee would have been used to reimburse the employees for transportation at the rate of 40c a day from Park City, and 35c a day from Heber, providing they kept within the absenteeism percentage of 4.5. DeVon Pope, president of Local 99, International Union of Mine, Mill & Smelter Workers, CIO, and Capt. Jerome Farrell, representing the labor division of the Ninth Service Command, addressed a meeting of the employees the afternoon of March 22, at which they voted to return to work.

★Hampton Mining Co., developing the old Argent lead-zinc mine, three miles from Stockton, has received a second RFC mine loan, amounting to $16,000. After the first loan of $5,000 was exhausted, the company continued shaft cleaning to a point where RFC engineers were able to make an examination, which justified the additional loan, which liquidated the first loan. Marlow Chamberlain, Stockton, is president, and Charles E. Street, Salt Lake City, secretary.

★Increased net profit in 1944 was reported by Chief Consolidated Mining Co., Eureka. After deduction of all charges except depreciation, the company had a net profit of $152,395 in 1944, compared with $88,434 for 1943. From 80,514 tons of ore mined from the 1,800 to the 2,250 level (below water level) of the main Chief No. 1 mine, there was produced 5,000,000 lb. of lead and 10,000,000 lb. of zinc. Only 61,810 tons of ore was mined in 1943.

★Output of Tintic Standard Mining Co., at Dividend, dropped from 58,705 tons in 1943 to 28,145 tons in 1944. In addition to other operations in wholly-owned subsidiaries and leases, the company produced 1,509 tons of fluorspar concentrates of metallurgical grade from its Cougar property. Outside transactions during 1944 included sale of 69,700 shares of New Park Mining Co. stock for $44,457, leaving Tintic Standard's investment in New Park at 278,400 shares on Dec. 31, 1944. The company joined with New Park Mining Co. in contributing $17,500 each to complete one or more oil wells in Wyoming. A total of 5,183,255 lb. of lead was produced in 1944, compared with 11,143,917 lb. in 1943.

PUNTA GORDA MOA MINING CAMP, Oriente Province, Cuba. Chrome ore is mined 1,900 ft. above this location, hand-loaded into trucks and hauled to a chute and storage bins. Reloaded into trucks, the ore is hauled to stockpiles at docks, where Caterpillar diesel tractor and Athey Mobiloader transfer the ore to barges for transport to ore boat.

★North Lily Mining Co., subsidiary of International Smelting & Refining Co., operating in the Tintic district, reported a net loss of $3,504 before depletion for 1944, compared with a profit of $17,384 in 1943. In 1944 a total of 13,944 tons of ore was mined, yielding 25,551 lb. of zinc, 48,929 lb. of lead, and 237,061 lb. of copper, compared with 11,549 tons of ore mined in 1943 yielding 340,696 lb. of zinc, 283,103 lb. of lead, and 241,537 lb. of copper. Development and production were conducted at the North Lily, Tintic Bullion, Eureka Bullion, Twentieth Century mines, and leaser operations at the Dragon and May Day mines and the Humbug claim.

★New Park Mining Co., at Keetley, had a net profit before depreciation of $301,425 in 1944, compared with $435,208 in 1943. During 1944, when monthly average man-shifts worked dropped from 232 in January to 194 per day for the entire year, the total tons of ore mined was 57,640, compared with 65,811 tons mined in 1943. The 1944 production included 449,930 oz. of silver, 719,317 lb. of copper, 8,005,803 lb. of lead, and 10,732,276 lb. of zinc. In 1943 the ore yielded 690,385 oz. of silver, 873,734 lb. of copper, 8,915,097 lb. of lead, 12,083,216 lb. of zinc.

★National Tunnel & Mines Co., Bingham, subsidiary of International Smelting & Refining Co., cut net loss before depletion from $366,596 in 1943 to $25,886 in 1944. The amortization charge on construction of the Elton tunnel, amounting to $208,351, was a major factor. A total of 159,303 tons of ore was mined in 1944, compared with 181,087 tons in 1943. Yield of metals in 1944 (with 1943 figures in parantheses) was: lead 885,020 lb. (1,556,963); zinc 508,901 lb. (669,-064); copper 5,496,187 lb. (5,276,099); silver 61,087 oz. (58,031).

★Four Utah mining companies will receive refunds totaling more than $183,203 plus interest since last November, because of a directed verdict given April 15 by Federal Judge Tillman D. Johnson, Salt Lake City, holding that three counties had collected taxes illegally assessed by the State Tax Commission, which had included

# Here are construction advantages in *Twin Parallel Cables* you just can't overlook!

## SECURITYFLEX

**NO TWISTING!** No failures due to one conductor riding over the other. The special D-shaped insulation prevents twisting.

**BREAKER STRIP!** Separation of the conductors saves time and trouble in making connections and splices.

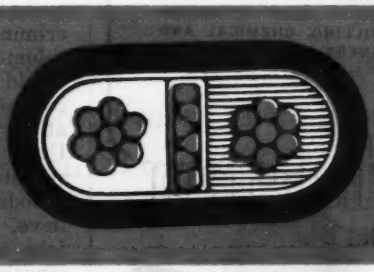
**GREATER FLEXIBILITY!** The herringbone compensating construction allows freer movement of copper conductor.

**REINFORCED WEBBING!** Tough Seine twine for extra strength prevents tearing of the jacket. Ask for detailed information at any of our sales offices.

45298

**SECURITYFLEX CABLE WITH SELF-CONTAINED GROUND WIRE**

This special cable is only slightly larger in diameter. Standard lengths can be accommodated on the usual conductor reels. Loaders, conveyors, cutters, etc., are easily grounded.



# *Anaconda Wire & Cable Co.*

ANACONDA

*Subsidiary of Anaconda Copper Mining Company*
GENERAL OFFICES: 25 Broadway, New York City 4
CHICAGO OFFICE: 20 North Wacker Drive 6
*Sales Offices in Principal Cities*

The adoption of more efficient methods in mining will mean more ore per man per shift. To some this spells survival. To others, progress and profits.

Southwestern Engineering Company offers a complete service for those who need professional or technical advice and follow-through. The Company's engineers, drawing on long successful experience, plan and design needed equipment. The Company's plant manufactures many items of such equipment under the same competent supervision.

Southwestern engineers also will advise you in the most efficient use of available equipment; how to improve and develop your plant with minimum of new hard-to-get equipment; how to repair and protect equipment that cannot immediately be replaced.

Southwestern metallurgists test your ores, plan the process and indicate the most efficient milling methods.

Write for information about Southwestern's service to mine operators.

•

INDUSTRIAL ENGINEERS AND CONSTRUCTORS—MANUFACTURERS OF ORE MILLING, CHEMICAL AND REFINERY EQUIPMENT.

•

Southwestern
ENGINEERING
COMPANY

4800 SANTA FE AVENUE
LOS ANGELES 11, CALIF.

• CABLE ADDRESS: SOUTHENG •


## Utah *(Continued)*

government subsidy payments in net annual proceeds. Kennecott Copper Co. (Utah Copper Co.) is to receive $121,300 from Salt Lake County, part of it because tailings pond disposal areas were assessed too high; Silver King Coalition Mines Co., $17,932 from Summit County; New Park Mining Co., $19,118 from Wasatch County, and Park Utah Consolidated Mines Co., $13,622 from Summit County and $11,229 from Wasatch County.

★Ohio Copper Co., of Utah, profit for 1944, before depreciation and depletion, was $40,198, compared with $106,381 for 1943, says the company's annual report. Major incomes came from operation of a tailings re-treatment mill at Lark. The Big Indian mine and concentrator at LaSal, San Juan County, was operated at a loss of $46,919 for the year. The loss on this operation in 1943 was $18,811. The increased loss was attributed to a WPB order diverting the acid supply necessary for the process. This necessitated substantial expenditure to convert to another process of treating the San Juan County copper ore.

★Delegates to the annual convention of district Union No. 2, International Union of Mine, Mill & Smelter Workers, CIO, held April 9-11 in Salt Lake City, requested revision of the Little Steel formula. Their resolution contended that even with wartime increase in wages due to overtime, salaries have increased less than 20 percent while living costs during the past four years have increased at least 30 percent. It criticized OPA for allowing continuous increases in living costs and failure to prevent black market prices.

Other resolutions asked for restoration of the War Labor Board's authority as originally conferred, and additional authority to give decisions on group insurance, unworked holidays, sick leave and severance pay; urged support of bills for establishing and developing a Missouri Valley Authority; for establishment of a fair employment practice committee as a permanent U.S. agency; went on record approving continuation of the committee's efforts to eradicate discrimination because of race, creed, or color; supported a petition which would bring the poll tax bill out of committee in the House of Representatives for vote, and called upon the Utah and Nevada senators and representatives to support the Bretton Woods agreement, which, they believe, would help provide 5,000,000 jobs in the transition period. After lengthy and heated discussion on the no-strike pledge, a compromise was reached. J. Frank Marble, district president-secretary, said: "Inasmuch as the pledge was made for the duration, we found it unnecessary to confirm it."

The present negotiating policy of the district was termed "unsatisfactory" for four reasons: Difficulty of each local to be represented on the central negotiating committee; contract committee expenses have been consistently out of reason and impose proportionately upon all locals whether or not representation or assistance has actually been given; unnecessary presence of several rank-and-file committee members while a paid officer of the union actually handled negotiations; "the questionable principle, tried year after year without success, of getting all operators to meet and bargain collectively, which plan has quite obviously the past several years been exploited by operators to disadvantage of workers, borne out by the following examples which cannot be honestly contradicted: (a) not one of the important gains of the union can be attributed to the fact that operators of industry bargained collectively with the union committee; (b) operators, at their convenience, desert any collective conference and deliberately employ every conceivable means to delay and confuse attempts to bargain, at cost to workers; (c) every major issue for the past three years has been certified to WLB without a single proposal of merit from operators in collective session."

The "new progressive negotiating policy" provides:

"That the convention was to select a negotiating policy committee as a regular convention committee to make recommendations on every phase of a complete policy to govern all contract negotiations.

"The convention must adopt model clauses on all contract issues which are of a common nature, plus suggested clauses dealing with issues of a peculiar nature.

"Each local union will elect its own negotiating committee immediately following adjournment of the convention to function strictly in accordance with the convention mandate.

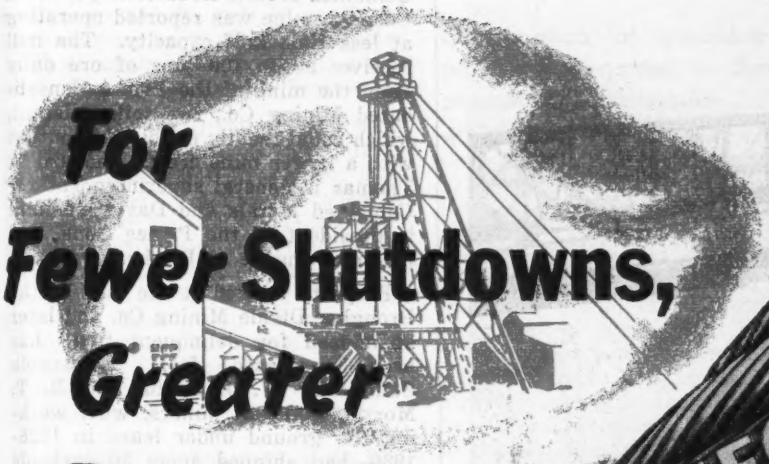
"The policy will further provide a definite date when negotiations on common clauses must be completed. On this date, a conference will be called by the district office, to which each local will send a member of its negotiating committee.

"As a matter of strict policy, so that solidarity may at all times prevail, no local union will be permitted to sign an agreement on any major issue until it has been approved by the general policy committee."

## NEVADA

### Deep drilling reveals lead-zinc ore in Locan shaft—Occurrence of nickel proves disappointing

★Production of zinc-lead-silver ore from mines near Pioche, in southeastern Nevada, continues seriously hampered by shortage of workers. The 100-ton selective-flotation mill of the



# For Fewer Shutdowns, Greater Production and..

"HERCULES" (RED-STRAND) PREFORMED WIRE ROPE

## ...Lower Costs

**YOU men who use wire rope know best what it means when a rope has to be replaced... Production stops, but *operating expenses continue.***

Time out for replacements can be minimized by the use of Preformed "HERCULES" (Red-Strand) Wire Rope, because this rope is the right combination of strength, toughness and durability, plus the definite advantages of preforming—the process that makes good wire rope better. As "HERCULES" is furnished in a wide range of constructions, there is—in this one grade—a right rope for every heavy duty purpose.

### Preforming *High-Lights*

1. As the wires and strands are shaped to the normal form they occupy in the rope, there is less turning and twisting... less wear... longer life.
2. It is more flexible, which combined with its inert qualities, make for smoother spooling... faster handling.
3. The preforming process reduces the tendency of Lang Lay wire rope to loop and squirm – thereby making it possible to utilize the many basic advantages of Lang Lay for more purposes.

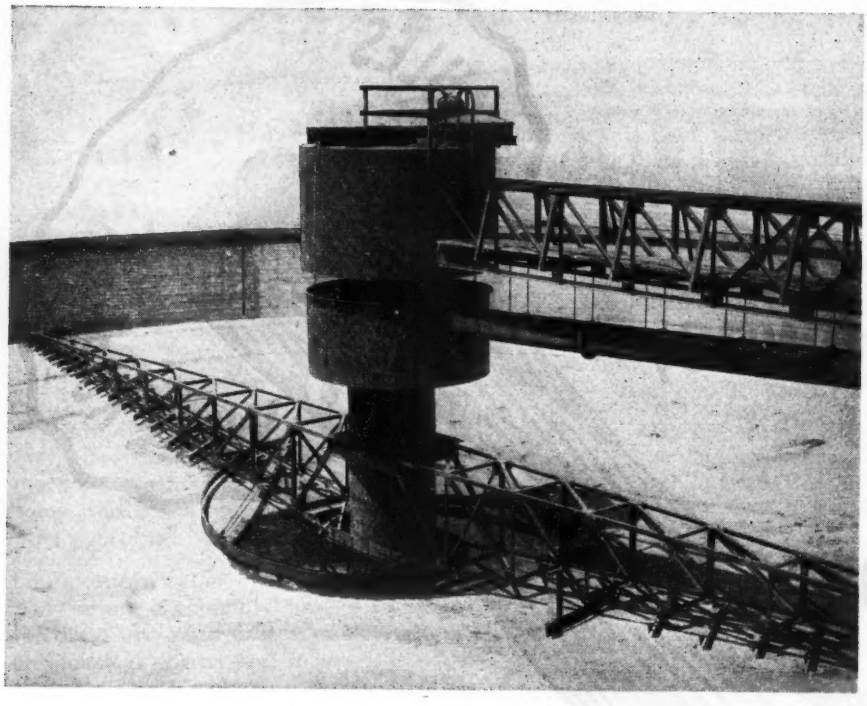
*Made Only By:*

**A. Leschen & Sons Rope Co.**

5909 KENNERLY AVENUE ST. LOUIS 12, MISSOURI

NEW YORK
CHICAGO
DENVER

SAN FRANCISCO
PORTLAND
SEATTLE



# CENTER PIER "AUTO-RAISE" THICKENER

The above photograph shows a 110 ft. diam. Hardinge Center Pier "Auto-Raise" Thickener. Note that the scraping mechanism consists of rakes near the end of the arms with double spirals near the center. The spirals remove the settled solids in one revolution thereby preventing an accumulation of solids at the center of the tank.

If an overload occurs due to power failure or any other cause the "Auto-Raise" mechanism lifts the complete scraping assembly above the overload then lowers it gradually as the overload is removed.

*Write for Bulletin 31-C.*

**HARDINGE**

COMPANY, INCORPORATED - YORK, PENNSYLVANIA

NEW YORK, CHICAGO, SAN FRANCISCO, TORONTO

CONICAL MILLS | COUNTER CURRENT CLASSIFIERS | THICKENERS CLARIFIERS | RUGGLES COLES DRYERS | CONSTANT WEIGHT FEEDERS | TUBE ROD AND BATCH MILLS

## Nevada *(Continued)*

Combined Metals Reduction Co. at its Caselton mine was reported operating at less than half capacity. The mill receives 90 to 100 tons of ore daily from the mine of the Prince Consolidated Mining Co., two miles distant, which could readily double this output with a larger mine crew. Leonard G. Thomas is general superintendent for Combined Metals and David Gemmill is president of the Prince Cons. and in direct charge at Pioche.

★Property worked at one time by the Brougher Divide Mining Co. and later abandoned for delinquent taxes has been purchased from Esmeralda County by W. J. Frank and R. T. Morris, Tonopah miners, who, working the ground under lease in 1928-1930, had shipped some 50 carloads of silver-gold ore to Utah smelters. They have resumed work in a 450-ft. winze, where they claim to have a 12-ft. width of siliceous ore in demand by smelters.

★Further sampling and analysis of one containing nickel, found in Paymaster Canyon, Esmeralda County, by Rosco Wright, of Goldfield, indicate that the nickel content is too low to warrant any work on the ground, although particles of fairly high-grade material are found in narrow seams. The vein matter, dark green in color, has been sampled repeatedly and tested for copper, with negative results.

★The Nevada-Massachusetts Co., currently the second-largest U. S. producer of tungsten, has a sizable development crew at work on a scheelite prospect near Paradise Hill, 25 miles north of Winnemucca in Humboldt County. John Etchart, foreman with the company's Golconda division, is in charge. By use of an ultraviolet lamp, scheelite was revealed in old tunnel workings.

★Deep drilling has been completed by the U. S. Bureau of Mines from the 900-ft. level of the Locan shaft of the Richmond Eureka property on Ruby Hill, two miles west of Eureka. Five diamond-drill holes, Bureau engineers reported, established the presence of large bodies of zinc-lead-silver ore around 2,500 ft. below the surface, the zinc content much higher than in ore south of the Ruby fault. The five-compartment shaft on the Fad claim, sunk to 650 ft. before the power plant burned last year, is to be continued to the ore horizon. Structural materials and equipment are being delivered and the shaft collar has been raised 15 ft. and concreted. The operation is conducted by the Eureka Corporation, Ltd., subsidiary of Ventures, Ltd., of Toronto. George W. Mitchell, Western manager for Ventures, has been at Eureka, where William Sharp is directing engineer.

★Deep drilling on property of the Mountain City Cons. Copper Co. in northern Elko County, halted in De-

cember by heavy storms, has been resumed by the Mitchell Diamond Drill Co., of San Francisco. The first hole, down 460 ft., will be continued to the copper zone, which is expected to be at around 650 ft. at this point, west of the productive Rio Tinto mine.

★Two of the old Divide district companies, the Thomson Divide Mining Co. and High Divide Mining Co., have been acquired by a group headed by Charles O. Willis, William H. Mitchell, and Frank Merilees, it was stated by former owners who controlled also the Tonopah Divide Mining Co., lately sold to a Reno group. Assessments of 4c. per share have been levied on stock of the Thomson Divide and High Divide companies, both of which have long been inactive.

★Announcement has been made that the M.G.L. Mining Corporation, formerly operating the Cowles tungsten mine and 120-ton concentrator near Nightingale, western Pershing County, was liquidated in December and no longer has any assets in Nevada. Arthur Letts, Jr., of Los Angeles, is president.

★Turquoise of gem quality is mined in considerable amount at Lone Mountain, Esmeralda County; Royston, in Nye County, and at Copper Basin, Goldacres, and near Austin, in Lander County. Higher-quality stones are cut and polished at Battle Mountain and Tonopah and sold mostly to New Mexico manufacturers of Indian jewelry. Mrs. Bessie Long, of Battle Mountain, has been one of the most persistent and successful miners and shippers. At one time Tiffany & Co., New York jewelers, were said to have financed production of turquoise of fine gem quality in a southern Nevada district.

★The annual report of the Goldfield Cons. Mines Co. will be delayed for some time because of the need to include details of new projects in which the company has become engaged within recent months. Officers remain unchanged, with George Wingfield president, T. L. Willcox secretary-treasurer, and Estey A. Julian managing engineer. Main offices are in Reno.

★Newly elected officers of the Nevada section, A.I.M.E., are Paul Gemmill, of the Prince Cons. Mining Co., chairman; Erich J. Schrader, consulting engineer, of Reno, and John W. Wilson, of Las Vegas, formerly with West End Chemical Co., vice chairmen; Jay A. Carpenter, director of the State Bureau of Mines, secretary and treasurer; with an executive committee including Glenn L. Allen, Nevada district engineer for the U. S. Bureau of Mines; Percy G. Dobson, manager for Summit King Mines, Ltd., a Bralorne Mines, Ltd., subsidiary; Richard S. Eskridge, Winnemucca engineer, and Kenyon E. Richard, geologist for Cons. Coppermines Corporation.

## CALIFORNIA

### Continuation of premium price policy advocated — Antimony smelter for El Segundo

★The San Francisco Chamber of Commerce, upon recommendation of its Mining Committee, advocates extension of the federal government premium-payment plan until June 30, 1946, urging congressional adoption of House Bill 2455 introduced by Congressman Engle, of California. The Chamber is supporting legislation which will extend the premium price plan for copper, lead, zinc, and other strategic metals on the same terms as heretofore, provided that premiums and indemnities shall be adjusted so as to return producers' wartime investments. Partly explaining why premiums are necessary, the resolution states, "The volumes of production which have been obtained would not have been possible under prevailing price and other wartime economic controls without the payment of premiums to producers through federal agencies such as RFC."

★Limited hydraulic mining operations are in progress at the Red Star placer mine, in the Michigan Bluff region of Placer County, with a small crew employed. The property is controlled and operated by the Red Star Mining Co., and work is carried on under a limited operation permit. Sufficient water is reported available to assure a normal mining season.

★A small crew of miners is employed in reconditioning old workings in the Gaston gold property, near Nevada City, Nevada County, optioned recently by the Tonopah Divide Mining Co. The mine is developed by tunnels and extensive lateral workings, and was operated by leasers until gold-mining operations were suspended by L-208.

★The State Senate committee on natural resources, after a hearing held on March 26, tabled Senate Bill 37, also known as the Dillinger Bill, under which dredge operators would be required to resoil dredged land. The vote was 7 to 1. Two subsequent attempts on the part of Senator Dillinger to obtain favorable action on the tabled bill also failed. On these occasions Senator Dillinger requested that the bill be lifted from the table to permit a broad amendment providing that resoiling could not be required where the market value of the land would not equal the cost of resoiling. Senator Ed Fletcher announced he opposed the bill until legal questions were satisfactorily cleared up.

★Exploration and development of a copper-zinc orebody uncovered a few months ago during road construction work in Hoopa Valley, Humboldt County, and subsequently investigated by the Scott interests of San Francisco, is scheduled to be increased at


LUBRIPLATE
No. 105

This very smooth, light density (semi-fluid) grease type lubricant resists water and other unfavorable operating conditions to a marked degree. LUBRIPLATE No. 105 not only provides superior lubrication but offers utmost protection against rust and corrosion. Because of its waterproof feature and freedom from "drag", it is ideal for

| | |
|---|---|
| General Industry | Firearms |
| Radio Equipment | Outboard Motors |
| Instruments | Home Appliances |
| Business Machines | Fishing Reels |

LUBRIPLATE
Lubricants definitely reduce friction and wear to a minimum. They lower power costs and prolong the life of equipment to an infinitely greater degree. LUBRIPLATE arrests progressive wear.

LUBRIPLATE
Lubricants protect machine parts against the destructive action of rust and corrosion. This feature alone puts LUBRIPLATE far out in front of conventional lubricants.

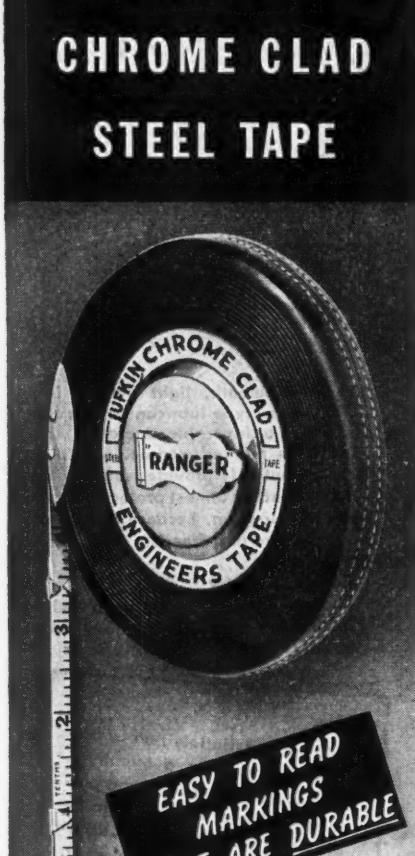
LUBRIPLATE
Lubricants are extremely economical for reason that they possess very long life and "stay-put" properties. A little LUBRIPLATE goes a long way.

Write for a booklet, "The LUBRIPLATE Film",

LUBRIPLATE
FISKE BROTHERS REFINING CO.
NEWARK 5, N. J.
TOLEDO 5, OHIO
OUR 75TH YEAR
1870 - 1945
DEALERS FROM COAST TO COAST

LUFKIN

"RANGER"
CHROME CLAD
STEEL TAPE




EASY TO READ MARKINGS THAT ARE DURABLE

The "Ranger" Chrome Clad is an engineers tape with ¼ inch wide, flexible line in genuine leather case. Most compact assembly.
Line marked either in feet, 10ths and 100ths or feet, inches and 8ths. Jet black markings are easy to read against a satin chrome surface that won't rust, crack, chip or peel. Write for free catalog.

BUY THROUGH YOUR DEALER

LUFKIN
PRECISION TOOLS • TAPES • RULES
SAGINAW, MICHIGAN NEW YORK CITY

## California *(Continued)*

once. J. H. Marsman, president, Marsman Company of California, is financially interested in the enterprise, and operations are directed by C. W. Erickson, superintendent.

★Golden Feather Dredging Co. is dismantling and moving its dragline dredging equipment from Oroville, Butte County, where, in addition to dredging, it was used in work to improve levee conditions, under contract with the city of Oroville, to the Howard Davis property on the Middle Fork of the American River, about 8 miles from Auburn, Placer County. E. A. Wiltsee is president of the company, and S. J. Norris, Jr., manager, directs operations.

★The Harshaw Chemical Co., Cleveland, Ohio, has authorized the construction of a new antimony smelter and oxide plant at its El Segundo works. The plant is now being designed and construction has been started by Southwestern Engineering Co., of Los Angeles. R. A. Lucht, assistant chief engineer of the Harshaw Chemical Co., is acting as technical adviser, with Harold B. Menardi, manager of the local division of the company, in direct charge of the project. Construction is expected to be finished in July this year. Completion of this smelter will add materially to southern California's production of refined metal products.

★The Black Hawk zinc-lead mine of the Pacific Atlantic Metals Corporation, near Caliente, is being sampled by American Zinc, Lead & Smelting Co. under the direction of H. I. Hayes, Western manager of American Zinc. In addition to this property, Pacific Atlantic owns the Gold Peak-Cowboy group of 19 claims in the same area, which have a past production of gold-silver ore, and on which development work has been started. A flotation mill in Caliente Canyon affords facilities for producing lead-zinc and gold-silver concentrates. Willard Hales is in charge of all mining and milling operations. The Black Hawk mine is under the supervision of H. A. Hukill.

# IDAHO

### Companies in Coeur d'Alene district report earnings and major developments for 1944

★Polaris Mining Co. has declared a dividend of 10c a share, payable April 20 to stock of record March 23, and totaling $200,000, which brings the company's total dividend record to $1,140,000. Control of Polaris stock is held by the Hecla Mining Co.

★The Callahan Consolidated Mining Co., operating the old Rex mine, in Nine Mile Canyon north of Wallace, reports net earnings of $64,095 for 1944, which earnings are before depletion deductions, according to Donald A. Callahan, president of the company. Ore milled during the year, says the company's annual report, totaled 21,439 tons, which produced 1383.66 tons of zinc concentrates and 718.95 tons of lead concentrates. Average metallic content of the ore prior to milling was 4.5 percent zinc, 2.8 percent lead, and 1 oz. of silver per ton.

★The new silver-lead vein being opened by the Coeur D'Alene Mines Corporation on the 2,200-ft. shaft level has now been followed a distance of 300 ft. from the shaft and the last 200 ft. has been in pay ore of varying widths up to 6 ft. Average sampling of the ore shows a mill feed averaging in excess of 20 oz. in silver, with some values in copper, lead, and antimony.

★Federal Mining & Smelting Co., during the 30 years since its organization, has produced from all of its mines in the Coeur d'Alenes of Idaho and the Tri-State district a total of 23,796,814 tons of silver-lead-zinc ores, which have netted, after smelter treatment, 10,892 oz. of gold, 40,966,476 oz. of silver, 953,171 tons of lead, and 818,233 tons of zinc, according to a summary of the company's total production in the official annual report for 1944.

The company's largest producer for many years has been the Morning mine, at Mullan, but developments during the past two years have produced another mine in the Kellogg area, the Page, which overshadows the Morning in tonnage and mineral values. During the same period the company has also developed a new source of ore in the old Frisco mine, at Gem, in Burke Canyon near Wallace, that is providing important zinc-lead tonnage. This property is producing about 100 tons per day, which is shipped to the Morning mill for treatment. Despite an acute labor shortage ore reserves estimated at 215,000 tons have been opened up. The Frisco ore averages 3.89 percent lead, 5.75 percent zinc, and 1.35 oz. silver per ton.

The company's Morning mine was short-handed throughout the year, operating most of the time on one shift per day. Earnings for this mine for the year 1944 are reported at $370,870, a decrease of $101,256 from the earnings of 1943. Morning ore treated for the year totaled 112,838 tons containing an average of 2.2 oz. of silver, 6.2 percent lead, and 7.3 percent zinc. In addition, the company milled 163,931 tons of old dump material containing 0.7 oz. silver, 1.2 percent lead, and 1 percent zinc per ton. This materials was cheaply handled with power shovel and truck.

At the Page mine the company developed a major-sized body of high-grade lead and zinc on the 2,400 level of the mine.

Page ore reserves at the end of the

year were estimated at 755,000 tons, an increase of 100,000 tons over 1933. Earnings of the mine for 1944, before deductions of any kind, totaled $787,918.84.

★The Dayrock Mining Co. reports the development of two new veins of lead-silver ore in the deeper levels of the mine. According to the report of Henry L. Day, manager of the company, these two veins are south of the original Dayrock vein and are designated as the Freeman and Ohio veins. "The Freeman vein contains several short shoots of high-grade ore," he states. "These are very erratic in strike and dip, but well worth the cost of development. The Ohio vein was drifted on extensively on the 300-, 400-, and 500-ft. levels. It promises to be a new source of substantial tonnages, although low in grade. The estimated average mineral content of the ore blocked out thus far is 3.3 oz. of silver and 5.4 percent lead per ton. An interesting feature in this connection is the fact that the Ohio vein is better on the lowest level in the mine, the 500, than at higher elevations." The company has recently installed a new electric hoist at a cost of approximately $25,000 for the purpose of sinking the shaft to the 700 and deeper levels. The modern flotation milling plant recently erected at the Dayrock mine, last year treated, in addition to Dayrock ores, 14,610 tons of custom ore from other properties.

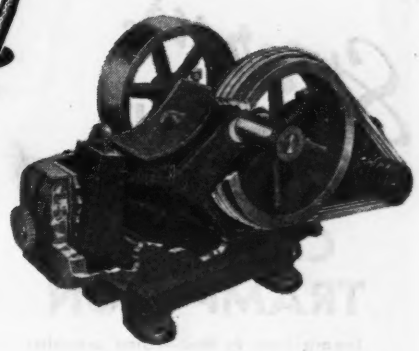
★Nabob Mining Co., in the Pine Creek section of the district, plans reopening of the property under the management of Duncan Bell, president; Clarence Dunkle, vice president, and Inor Norgaard, general manager, all of Pinehurst, Idaho, and Clarence E. Nugent, of Smelterville, secretary-treasurer. The Nabob adjoins the Sidney mine on the south and east. It has been extensively prospected but has not been productive up to date, although several shoots of milling ore are said to have been located.

★The Snoose property, near Hailey, Idaho, owned by A. M. Jensen and Harry J. Stevens, members of the operating force at the Triumph mine, has been shipping two cars of lead-zinc ore weekly from prospecting operations. The owners have now installed electric hoisting and other mine equipment and the Idaho Power Co. is building an electric power line to the property from the Triumph station.

★Nonpareil Copper Mining Co., in the Mullan district, has filed with the county recorder a certificate of reinstatement of its official charter with the State, which was allowed to lapse several years ago.

★The annual report of the Tamarack & Custer Mining Co. announces a loss of $77,456 for the year 1944 after deducting $415,182 for depreciation, depletion, and Idaho State taxes. Lack of manpower is given as the reason for failure to pay dividends during


"RUGGED AS A RHINO"



...That's the DFC Laboratory Crusher. Compact, self-contained crusher, simple in design and economical to operate.

## The High Points of the DFC Laboratory Crusher are:

- Sturdy one-piece frame for durability.
- Pitman toggle movement eliminates the toggle pin, minimizes wear.
- Jaw plates adjustable for fineness of product . . . reversible for double life.
- Removable jaw plates make cleaning easy and eliminate possibilities of salting.
- Suspended motor support for uniform V-belt tension.
- Reduces hard or soft rock to 1/4" and finer at the rate of 50 to 150 lbs. per hour.

Available in two sizes; both with flat belt, or multiple V-belt motor drive. Write for complete information.

The DENVER FIRE CLAY Company
EL PASO, TEXAS · NEW YORK, N.Y. · DFC · SALT LAKE CITY, UTAH
DENVER, COLO., U. S. A.

Stearns Spout
MAGNETS
CATCH the
TRAMP IRON

**Tramp Iron Is Bad—ruins machinery, menaces safety, may cause disastrous fires and explosions that hold up production.**

**Stearns Automatic Spout Magnets, electrically energized for more power, will do a surprisingly fine job for you in catching tramp iron in your processing flow. And—the accumulated scrap metal will help, if not entirely pay for the magnetic equipment.**

**In sizes to fit your conveying system. Write us for operating data, describe your material, capacities, send layout drawing.**

**STEARNS MAGNETIC MANUFACTURING CO.**
**624 S. 28th St., Milwaukee, Wis.**
Pulleys .. Separators .. Clutches .. Brakes

## Idaho *(Continued)*

the last half of 1944. Earlier in the year the company paid two dividends, totaling $250,000, which brought total dividends to date to $2,642,123. The metals produced from the tonnage mined in 1944 totaled approximately 1,011,000 oz. of silver, 894,000 lb. of lead, and 231,000 lb. of copper.

★C. O. Dunlop, president and manager of the Silver Dollar Mining Co., has submitted the company's annual report to stockholders for the year 1944, in which it is stated that the company's gross income from mining operations was $242,370. Deductions include royalties of $28,991 paid the Lincoln Mining Co., general mining expenses of $140,071, general and administrative expense of $22,376, general tax expenses of $10,549, and federal income tax of $14,902, leaving a net balance of $25,479.

★Highland-Surprise Mining Co. has opened its Surprise vein in a crosscut from the 700-ft. shaft level in the Pine Creek section of Coeur d'Alene district, showing a 16-ft. width of milling-grade zinc-lead ore. The company is equipped with a modern 125-ton capacity flotation mill and is shipping about 400 tons per month of a combined zinc-lead concentrate to the Sullivan zinc plant, at Kellogg.

★Jack Waite Mining Co., whose property in the Murray district of the Coeur d'Alenes is operated by the A.S.&R. Co. on a division of profits agreement, reports a net profit to the Jack Waite company of $20,455 for 1944 before deductions.

★Net smelter returns of $26,820 have been received by the Lucky Friday Silver-Lead Mining Co. for two cars of silver-lead concentrates shipped to the A.S.&R. East Helena smelter and one car of zinc concentrates shipped to the Sullivan zinc plant.

★Sliver Crescent Mining Co.'s Moon Creek mill, between Wallace and Kellogg, which is under lease to E. G. Smith, has been subleased to Hecla Mining Co. Hecla is using the mill to help out in the treatment of tailings from the Osburn tailings deposit while the premium payment on zinc is in effect.

★Sherman Lead Co. reports net profits of $42,022 for the year 1944 after the deduction of all charges. The property is operated through the old Hercules tunnel at Burke, where a new mill was recently built to handle Sherman ore.

## ARIZONA

### High Court rebukes former Tax Commissioners for excessive valuation of mining property

★The Arizona State Tax Commission has taken under advisement Magma Copper Co.'s protest, filed March 28, of an extra income tax assessment of $88,432 in 1943. Magma officials charged that in computing the tax appraisers failed to take depletion into consideration. Magma's main holdings are in Superior and are steady producers of copper and zinc ores. Zinc is separated from the copper by the company's selective flotation plant in Superior. The main output of the mine is copper ore and is shipped direct to the smelter.

★The Giacomo interests of Tombstone are sinking a two-compartment shaft to a depth of 250 ft. on the old Costello mine. This mine was patented in 1880 and adjoins the old Toughnut mine, one of the first developed in the Tombstone district. The mine has been renamed the "Intervina," and the Giacomos have leased and bonded the property for a period of six years. The main values of the mine are in lead, zinc, gold, and silver.

★Extension of the government premium payments on copper, lead, and zinc until June 30, 1946, has the approval of the United States Senate, according to Senator Ernest W. McFarland, of Arizona, who introduced a bill in Congress for that purpose. Besides extending the premium payments on the same terms as before, the bill sets forth that all classes of premiums shall be non-cancellable unless necessary to make individual adjustments of income to specific mines.

★The Arizona State Tax Commission has taken under advisement the $70,522 additional assessment of Inspiration Consolidated Copper Co., made by the former majority bloc of the commission when it disallowed deductions for depletion over a year ago. The company and the director of the income tax division under the present commission agreed the company had $17,932,960 in its depletion valuation.

★Benjamin Joy, of Mayer, has recently shipped a carload of copper ore to the smelter from the Yellow Kid mine, in the Mayer district.

★J. W. Lemon, who is working the Alma property near Groom Creek, is sinking a 100-ft. shaft on the property. The main values of this mine are lead and gold.

★Great Western Mica Corporation has taken over the Mica Giant and Wayne mining properties near Kingman. The corporation plans to install a grinding and screening mill, which will produce scrap mica. O. K. Bechmann, president, and John G. Becker, secretary-treasurer, are in charge.

★A $35,000 damage suit has been filed by J. P. Zannaras and J. P. Robinson, Jr., mining claim operators in Yavapai and Mojave counties, against the Bagdad Copper Corporation in the U. S. District Court in Phoenix. The plaintiffs claim that up to December 1943 they operated a mill for concentrating tungsten ores

at Burro Creek, in Mohave County. They were able to operate their mill until the Bagdad mill polluted their milling water with mineral tailings, rendering the water useless for tungsten concentration, they allege. In addition, the complaint states, large quantities of tailings from the Bagdad mill have been deposited on the plaintiffs' millsite.

★Rebuking the former majority bloc of the State Tax Commission for making "a puerile appeal," the Arizona Supreme Court sustained a 1943 valuation of $7,477,770 on Phelps Dodge Corporation's United Verde mine, which had been fixed by the Superior Court of Yavapai County. The former commission majority bloc had valued the property at more than $14½ million. Phelps Dodge won judgment of $89,968, representing excess taxes paid on the repudiated valuation.

★The Houston Oil Field Material Co., of Houston, Tex., through its vice president and representative, E. H. Robertson, has taken over the Chrisman barite mine, near Stewart Mountain Dam, Mesa, from Mrs. Chrisman, the owner. William Paine, of Prescott and Phoenix, Ariz., a diamond drill contractor, will be the active manager of the property. Mr. Robertson stated that the Arizona Department of Mineral Resources also rendered valuable aid in bringing about prospective barite production.

★Jess French and W. W. Whiting have opened a 4-ft. vein of high-grade copper ore on the Diana Mae property, 35 miles northeast of Bouse, and are preparing to ship. The Diana is leased from J. C. Townsend, of Bouse.

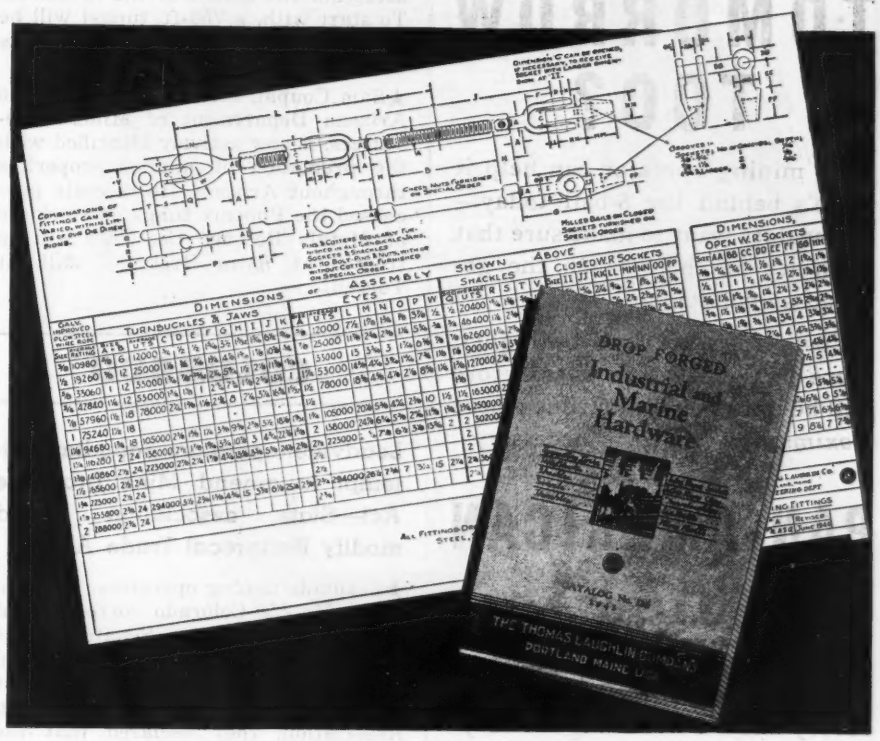
★Charles Milton, mining engineer, Bouse, and his company has taken a lease and bond on the Mystery Hill group of claims from the Mildred Mining Co. Milton's company is the Carnation Mining Co., a Delaware corporation.

★Tom Rodgers, of Wenden, will resume work on his lead mine, the Red Hill, which was included in the bombing range used by the Army. His property has been returned to him, following its use in the war effort.

★The Copper Belt Mining Co., 20 miles south of Aguila, has employed 11 men and is now busy constructing a mining camp, including bunkhouses and a boarding house, so men can stay on the property. The shaft is down 125 ft. and will be sunk to the 225-ft. level, where drifts and crosscuts will be driven. Work is on a 3-ft. vein of copper ore. The property is equipped with a 210-cu. ft. air compressor, a 20-hp. hoist, machine drills, and other equipment including an electric lighting plant. Twenty-one claims in the group are leased from R. C. Davis, of Glendale, Calif. H. J. Thomas is manager and L. G. Andrews, of Aguila, Ariz., superintendent. Ores assay 5 percent copper and $12 in gold.

★Harry W. W. Harriett, of Parker,


NEW CATALOG ON THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS




NEW ITEMS . . . NEW ENGINEERING DATA
SIMPLIFY SELECTION OF THE RIGHT FITTINGS

To simplify your job of selecting the right combination of fittings for any wire rope or chain assembly . . . Laughlin's new Industrial and Marine Hardware Catalog No. 135 is now ready.

This catalog displays every item in the most complete line of drop-forged wire rope and chain fittings on the market. New items have been added since the last catalog was published — and your nearby mill, mine or oil field supply house is taking orders for them.

New engineering data and tables simplify such problems as picking the right hook for a specified rope or chain size and safe load . . . the right products for a turnbuckle assembly with shackles or sockets . . . and many others.

Your file of vital buying information will not be complete until you have this handy catalog at your finger tips. Write on your business letterhead for your copy of Catalog 135. Dept 5, The Thomas Laughlin Co., Portland 6, Maine.

LAUGHLIN

THE MOST COMPLETE LINE OF DROP-FORGED WIRE ROPE AND CHAIN FITTINGS

# TOMORROW TOO?

No mining operator can help it if he's behind the 8-ball today—but he does want to make sure that he won't be there when the go-ahead signal comes.

Costs are certain to be higher. More properties than ever before will be in the marginal zone where *maximum recovery* is necessary.

# PAN-AMERICAN JIGS

have become standard equipment around the world for increased recovery under a wide range of varying conditions in mill and placer operation. Perhaps they can help you.

It costs only a postage stamp for you to get up-to-date information about Pan-American Jigs and their recovery records. Ask for it today.

PAN-AMERICAN ENGINEERING CO.

820 PARKER STREET
BERKELEY 2, CALIFORNIA, U.S.A.

CABLE ADDRESS: "PANCO"

●Design, Metallurgical Testing and Field Consulting Service; Manufacturers of Mill and Placer Recovery Equipment

## Arizona (*Continued*)

has a contract with the Copper Cloud Mining Co. to dewater the shaft and put the mine in condition for extraction of ore. The company plans to ship a car a week, or more, of 5 percent ore to the Clarksdale smelter.

★W. L. Smith and associates, of Long Beach, Calif., have purchased the Ruth mine, in the Hassayampa mining district, 7 miles south of Prescott. It is understood the new owners plan an intensive development program to ascertain the extent of the orebodies. To start with, a 750-ft. tunnel will be driven to tap the old workings. Drifts will be run every 100 ft.

★Sam Coupal, former director of the Arizona Department of Mineral Resources, is now actively identified with the promotion of mining properties throughout Arizona. He recently purchased the Phoenix tungsten stockpile of Metals Reserve Co. This will be treated at Ryan Brothers' mill, at Tucson.

## COLORADO

### Leadville operators repudiate attempt to amend Mine Drainage Act—State association would modify Reciprocal Trade Act

★Leadville mining operators, to whom *E. & M. J.'s* Colorado correspondent attributed support of Senate Bill 84 in the Colorado Assembly, have denied such support. By a vote of 17 to 8, at a meeting of the Lake County Mining Association, they declared that the bill was not in the best interests of the Leadville district. A statement in the Leadville *Herald-Democrat*, attributed to the operators, declared the bill was never their idea, but was introduced by a senator from Denver. A copy of the bill as printed in the Senate shows it was by Senators R. G. Bosworth, Republican leader, of Denver; Frank P. Conroy, of Idaho Springs; Harold Ward Gardner, of Golden; Harry D. McDonald, of Colorado Springs, and Edgar W. Bray, of Redvale. Each of the four last-named senators has mining interests in his district, but none represents Lake County (Leadville).

The bill would have amended the Mine Drainage Act of 1935 in two respects; operators would not have had to pay for benefits from a mine drainage project if it were financed by the U. S. or if it drained undeveloped ground. Naturally, if passed it would have purported to relieve Leadville operators of paying for benefits from the deep-drainage tunnel, for which $1,400,000 has been appropriated by Congress. The bill died in the House. Coincidentally with its expiration as the session ended, it was announced in Washington that the Bureau of Mines was seeking $1,600,000 from Congress to complete the tunnel and that members of the Colorado delegation would appear in favor of the appropriation. The tunnel is now in somewhat over a mile and, according to Representative Robert Rockwell, more than $1,000,000 has been spent.

★Twelve Turkish students selected by the government of that country—part of a group of 52 being sent to the U. S. for higher education—will enter the Colorado School of Mines at Golden on May 28, starting with the pioneer 16 weeks' intensive English course referred to last month. The students, graduates of technical courses of high-school grade in Turkey, will then study engineering, not necessarily at Mines. Four young South Americans are now completing the course.

★The Colorado Mining Association has adopted, and is advocating, a program for amendment of the Reciprocal Trade Act as follows:

1. Terms of proposed reciprocal trade agreements relating to tariff changes shall be made public at least six months prior to their execution.

2. At any time during the six months, proposed tariff changes shall be subject to veto by one-third of the Senate.

3. Escape clauses shall be put in all trade agreements, and shall be invoked at any time during the life of any treaty upon the request of one-third of the Senate.

★Merrill E. Shoup, president of Golden Cycle Corporation, says that company is ready to start full-scale production at Cripple Creek as soon as the war ends and enough miners are released from the Army. He said the company has enough materials to start mining right now, but hasn't the men. He estimated that shipments from Cripple Creek to the mill at Colorado Springs are running about 10 per cent of normal, and that half of them are dump ore. Exploration is still finding good ore in the Ajax mine, he said, and when mining is resumed he thinks the ore at the mill will run better than for the last 15 years. Over-all average of values from Ajax is $45 a ton.

★Governor Vivian has signed a State act providing compensation for vocational diseases as passed by the recent Assembly. It is elective in nature, in the same manner as the Workmen's Compensation Act.

★The miners' vocational school at Idaho Springs conducted by Alfred Tellam has acquired a cyanide unit, concentrating table, and rod mill. The equipment is being used by small operators as a laboratory to work out proposed devices and improvements at mines. However, as a War Training Fund project, government aid may be withdrawn by July 1. The community may therefore have to decide if it wishes to pay 55 percent of instruction costs, plus all other costs, the State assuming only the remaining 45 percent of instruction costs. The Assem-

bly has cut requested vocational appropriations to that extent because it is certain the State can do no more than that.

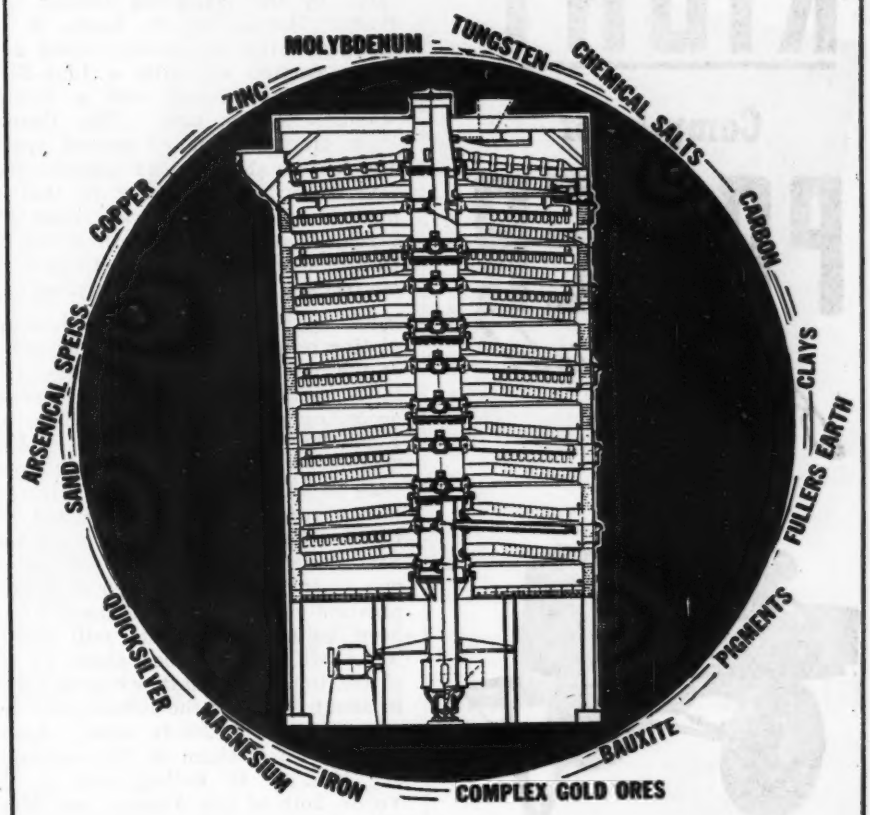
## TRI-STATE

### Eagle-Picher foresees years of production if metal prices and tariff policies are favorable

★Of interest to the Tri-State mining industry were the optimistic views concerning the future of the district expressed in the annual report to stockholders of the Eagle-Picher Co., excerpts from which follow: "Your management has no doubt of the ability of the district to continue to produce sufficient raw materials to meet the requirements of its processing plants. To reply specifically and categorically as to the extent of the company's reserves in the Tri-State field is impossible. There is every geological assurance that very substantial reserves exist. However, the mere existence of such reserves in the ground gives no commensurate assurance of their commercial recoverability. That is dependent upon many factors, chief among which is the price structure and the effect upon it of the balance between supply and demand; and governmental policy with respect to reciprocal trade agreements and tariffs. It seems to your management that it must have confidence that these problems will be solved by our national administrators and legislators in such a way as will best protect domestic industry and our accepted standards of living. Given a fair price, your management expects to recover zinc from the Tri-State mines for many years to come."

To substantiate the views of its management, the company recently disclosed that churn drilling has proved the existence of the M-bed in the Miami trough on the Foley lease, which adjoins the famous Westside-Barr mine on the north. The ore run was picked up at a depth of 400 to 440 ft., more than 100 ft. deeper than that of the Westside-Barr property, which is situated north of Picher just over the Kansas-Oklahoma line. The new strike is in virgin ground, and the company has extended its drilling to include the Mullens lease, another 160-acre tract north of the Foley. The company is reopening the old Foley mill shaft, which will be sunk 120 to 130 ft. deeper, according to S. S. Clarke, general mine superintendent for the company. Other strikes made by the company recently were on the B. & R. lease, on the Lottson allotment, a half-mile southwest of Cardin, at a depth of 15 to 20 ft. below the general run of ore at the 280-285-ft. level. A steel derrick and 500-ton hopper is being moved from the old Crystal mine to the No. 2 shaft on the B.&R. to exploit the lower run of ore.

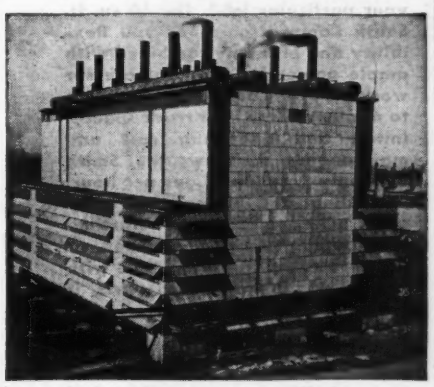

1889 1945




Since 1889, when the first Nichols Herreshoff Multiple Hearth air-cooled furnace began roasting ores, continuous advancements in basic design have been made to assure an efficient and economcial means of roasting, calcining and drying.

Given above are a few of the many materials thermally processed in Nichols Herreshoff Multiple Hearth Furnaces with outstanding success.

Nichols engineers can focus a wealth of experience upon your particular problem of roasting, calcining or drying. Thousands of furnaces have been installed, scores of materials processed. This fund of knowledge is invaluable. Consult a Nichols engineer to secure the benefit of this long experience in construction and design.



Above is one of the largest vital war material plants, designed by Nichols, for roasting limonite and serpentine ores for the economical production of NICKEL.

NICHOLS
ENGINEERING & NERCO RESEARCH CORP.
60 WALL TOWER BUILDING
NEW YORK 5, N. Y.
UNIVERSITY TOWER BLDG.
MONTREAL, P. Q.

**Consider your need for the**

# RIGHT

**Compressor**

# POWER

*for your job!*

**You wouldn't use a derrick to move your living room chair. Why use an unwieldy, expensive-to-operate compressor that gives you much more power than you need for your particular job? The 60 cu. ft. Smith Compressor gives you flexibility and economy combined with ample power for most compressor work. Move it easily from one job to another. Tow it at truck speeds. Initial and operating cost and maintenance are low; the Smith uses only 1 gallon of gas per hour. Unloading and idling are automatic, the machine self-starting. No couplings, belts, clutches or gears to cause trouble. Made with Ford motor and standard parts, it can be serviced anywhere.**

*May we tell you more about Smith Compressors? Wire, phone, or write today!*

**GORDON**

**Smith**

**& CO.** Incorporated

505 College St. Bowling Green, Ky.

## Tri-State *(Continued)*

★Open-pit mining of the old Crown Point land, a 54-acre tract situated just east of Duenweg and south of U. S. Highway 166, formerly Missouri State Highway 14, has been inaugurated by the Magajupa Mining Co. Walter Martin, of St. Louis, is in charge of the operations, which are being carried on with a Link-Belt ⅝-yd. power shovel and a P.&H. ¾-yd. dragline unit. The Crown Point tract was mined several years ago for the shallow lead deposits discovered on it, and prior to that a number of years ago was mined by Birch & Carmean to a depth of 158 ft. Ore from the present operations is to be trucked to the Webb City mill.

★Kansas Stateline Mine, Inc., is completing preparations for the reopening of the old Kansas Stateline mine, 1½ miles northeast of Picher, in Kansas, according to William T. Graham, of Kernville, Calif., formerly of Joplin. The old mine, which was opened more than 25 years ago by the late George Meese and associates, is situated on the Pearl Lindsey land bordering the State line on the north. The mine was last operated during the depression years. A sinking derrick has been built over the old mill shaft, which will be recribbed about 15 ft. at the top. The shaft, which is filled in about 30 ft. at the bottom, will be reopened to the 200-ft. level. Associated with Graham in the company are Mrs. A. R. Kellogg and A. C. Voyer, both of Los Angeles, and Mrs. B. L. Warner, of Phelan, Calif.

★Charles H. Johnson, former district engineer for the U. S. Bureau of Mines at Silver City, N. M., who has been named chief of the mining branch, Rolla division, under the new reorganization set-up of the Bureau, spent several days during the first week of April in the Tri-State district. He was accompanied on the field trip by W. D. McMillan, Tri-State engineer for the Bureau, who for the time being will remain in Rolla to assist Johnson in the supervisory work of the newly created division; also by Clinton C. Knox and Otto Ruhl, of the Joplin office of the Bureau. Johnson said Knox and Ruhl, together with Louis C. Brichta, will continue to comprise the personnel of the Joplin office.

## NORTH CAROLINA

### Justice Department subpoenas records of mica companies—Tungsten areas prove productive

★The right to subpoena records of several mica companies and supplemental records of other companies was granted the Department of Justice at a hearing before U. S. District Judge E. Yates Webb at Shelby, N. C., March 31. Records of the following companies, dating back to 1937 in some cases, will be subpoenaed for examination: English Mica Co., Spruce Pine, N. C.; the Asheville Mica Co., Asheville, N. C.; A. O. Schoonmaker Insulation Co., New York; the Macallen Co. and Hulse-Liberty Co., Boston; the Land & Mineral Co. and the Western Carolina Mica Co., Biltmore, N. C. The Continental Diamond Fibre Co., Dover, Del., and the New England Mica Co., Waltham, Mass., indicated a willingness to produce records. Western Electric Co., Westinghouse Electric & Manufacturing Co., and General Electric Co. have agreed to permit examination of records.

★According to a report of the U. S. Bureau of Mines, more than $300,000 worth of tungsten has been taken from deposits in Vance County, N. C., and Mecklenburg County, Va., since the deposits were discovered by Joseph and Richard Hamme in 1942 and the area was mapped by the U. S. Bureau of Mines and the U. S. Geological Survey. The tungsten-bearing quartz deposits lie in granite and are found in an area eight miles long and one mile wide. Veins up to 30 ft. thick have been discovered. Drilling and underground mining to depths of nearly 200 ft. have shown that there is practically no change in the character of the veins or content of the ore.

★H. A. Bland, of Raleigh, has been appointed agent of the Bureau of Mines to issue licenses for the purchase, handling, and use of explosives and explosive ingredients in the Carolinas. He succeeds D. D. Munns, who resigned on entering the Army.

## ARKANSAS

### Weather seriously affects both zinc and manganese production—Barite deposits get attention

★Heavy rains, which started early in February and continued into the first week in April, have reduced ore production in the Batesville manganese field. Most of the creeks in the field have been out of banks, and work in the shafts, drifts, and tunnels has been blocked by excess water. Mine roads leading off the surfaced highways have been nearly impassable during the entire wet period.

★Production in the field during the month of March ran to 801 tons, of which 399 tons was high grade and 402 tons low grade. All of the high grade was purchased by Metals Reserve at the buying depot at Batesville. The low grade was shipped directly to the furnaces.

★No ore has been shipped from the northern Arkansas zinc field for the last 30 days, but production is under

way and shipments will probably start the last of April or early in May.

★S. and G., Inc., operating the Hurricane mine, in Searcy County (Tom Grimmet and J. C. Shepherd, of Harrison), is now in production. Extreme dry weather in the area stopped operations by causing a water shortage for mill operations. Big rains during the last six weeks have filled the ponds, and the mill is in operation.

★The Hall Mountain Mining Co., operating properties in the Hall Mountain area, near Yellville, will start work on the properties soon. J. C. Jones, in charge of operations, had a heart attack last winter, but has recovered and will be back on the job late in April or early in May.

★The Arkansas Mining & Refining Trust Co., operating the North Star mine, near Harrison, is in production. It will ship mine-run ore to Eagle-Picher, in the Tri-State field. Operations are in charge of John Stone, of Harrison. There are 10 carloads on the dump ready for shipment, which will run about 6 percent metallic zinc. The company has installed a new loading ramp and picking belt. It has also leased and purchased a large deposit of kaolinite and iron near Ponca, in Newton County, but has no plans yet for operation.

★Lewis Flader and associates, operating on Sec. 16, Marion County, near Buffalo, are moving in mill equipment for the construction of a modern plant.

★No definite site for the proposed U. S. Bureau of Mines experimental bauxite mine has yet been selected. Leon W. Dupuy has been transferred from Washington, D. C. to take charge of this project. Further studies of probable sites are being made.

★It is reported that the U. S. Bureau of Mines bauxite drilling project will probably be terminated at an early date. Mark C. Malamphy is the project engineer on this operation, which has been under way nearly three years.

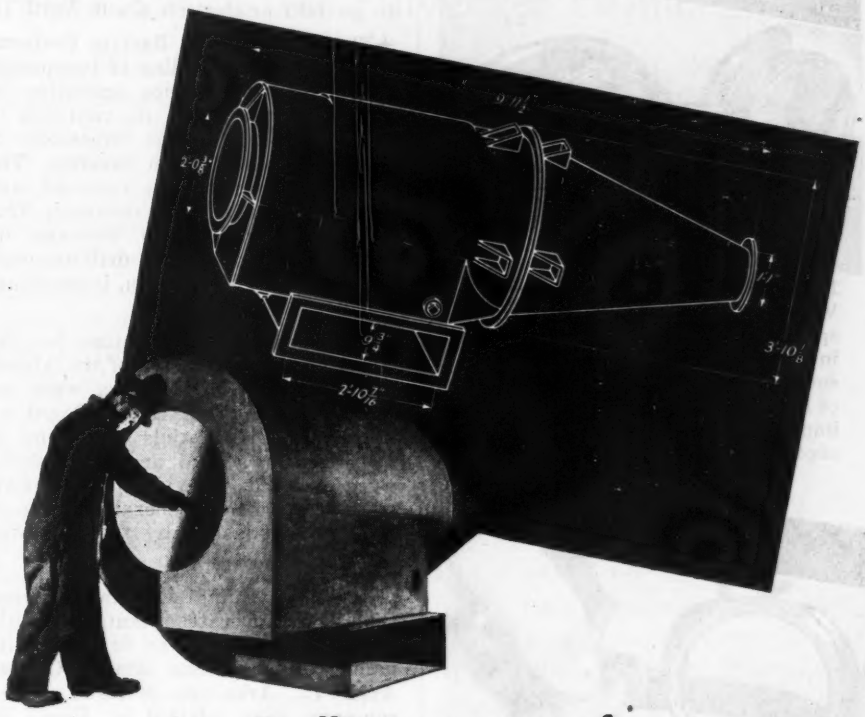
★The barite diamond core drilling project of the U. S. Bureau of Mines in Montgomery County is still in progress. Three holes have been drilled to date on the Gap Mountain deposit. R. B. McElwaine is the engineer in charge.

★Churn drilling on the Magnet Cove Rutile Co. property at Magnet Cove is continuing. R. V. Spencer is the engineer in charge.

★The U. S. Bureau of Mines bauxite pilot plant being constructed at Bauxite is nearing completion so far as heavy construction is concerned. Several thousand tons of bauxite have been stockpiled at the plant. E. G. Howe is the engineer in charge.

★The new mill for the manufacture of drilling mud, being constructed by Western Knapp Engineering Co. for the Baroid Sales Division of National


# LARGE DIAMETERS



## *Buell's assurance of*
## HIGH EFFICIENCY, LOW MAINTENANCE, LONG LIFE

THE DECIDED ADVANTAGES of Buell's large diameter cyclones, made possible by the patented "Shave-Off", definitely reflect industry's growing preference for Buell (van Tongeren) Dust Recovery Systems.

*Large diameters* make possible a collection operation with low centrifugal force and permit construction of extra thick steel. This accomplishes two things: minimum abrasion and long life. *Large diameters* afford large dust outlets, making clogging practically nil. *Large diameter* cyclones have the added advantage of handling a given gas volume with fewer units.

Engineers who look to low cost up-keep and continuous operation as prime requisites in dust recovery should give these factors serious consideration.

**BUELL FEATURES**

SHAVE-OFF
LARGE DIAMETERS
EXTRA-STURDY CONSTRUCTION
CORRECT HOPPER DESIGN
SPLIT-DUCT MANIFOLDS
INNER WELDS GROUND SMOOTH

**RESULT IN**

HIGH COLLECTION EFFICIENCY
LESS FAN BLADE WEAR
LOW DRAFT LOSS
LOW POWER CONSUMPTION
HIGH TEMPERATURE RESISTANCE
UNLIMITED CAPACITY
NO MOVING PARTS
FREE DUST FLOW

**PRODUCE**

HIGH EFFICIENCY
LOW MAINTENANCE
LOW OPERATING COST
LONG LIFE
NO CLOGGING

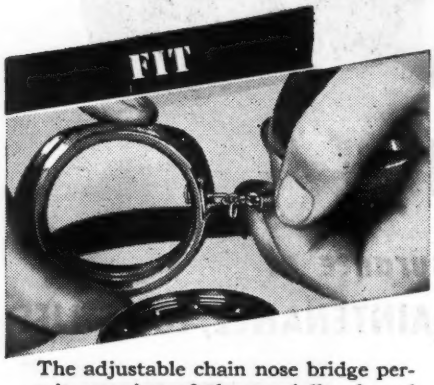
buell
DUST RECOVERY SYSTEMS

Engineers and plant executives are invited to write for Buell's factual 28-page book:
*"The van Tongeren System of Industrial Dust Recovery"*

BUELL ENGINEERING COMPANY, INC.
Suite 5000, 60 Wall Tower, New York 5, N. Y.
*Sales Representatives in Principal Cities*

*DESIGNED TO DO A JOB, NOT JUST TO MEET A "SPEC"*

Model RR50, one of more than 20 Willson Cup Goggles, meets Federal specifications for worker eye protection in chipping, grinding, riveting, sledging, snagging. The thick Super-Tough lenses of heat treated glass have high frontal impact strength. Reinforced plastic eye cups give side protection.




The adjustable chain nose bridge permits spacing of the specially shaped eye cups for proper fit. Adjustable headband holds cups snugly against the face. No pressure on nose, no high spot pressure on face when properly adjusted.

Smooth plastic eye cups with rolled edges are specially shaped to left and right eye socket contours so they always feel comfortable. Direct or indirect cup ventilation and lens ventilation assure seeing comfort and minimize lens fogging.

*For help on eye protection problems, consult your Willson distributor, or write department EM-9.*

GOGGLES • RESPIRATORS • GAS MASKS • HELMETS

DOUBLE WILLSON

PRODUCTS INCORPORATED

READING, PA., U.S.A.


## Arkansas (*Continued*)

Lead Co. on the company's barite property at Magnet Cove is expected to go into production about April 15.

★The Magnet Cove Barium Corporation reports the flooding of two pumps in its open-pit barite operation in Magnet Cove. A 6¾-in. rain fell in one night, and it was impossible to save the pumps from flooding. The water has since been removed and operations have been resumed. This company continues to increase its monthly production of drilling mud. Harry Broan, of Malvern, is president and general manager.

★Increased shift differentials for 50,000 workers in 20 plants of the Aluminum Company of America were ordered by the War Labor Board on March 26. Differentials of 4c and 6c an hour for second and third shifts were ordered. Previous differentials were 3c and 5c. A general increase of 15c an hour asked by the CIO was denied.

★Republic Mining & Manufacturing Co., which operates plants in Little Rock and Bauxite, was to change its name to the Alcoa Mining Co. on April 15, Arkansas officials of the company were advised by Frank B. Cuff, president. The Republic, prominently identified with American bauxite mining operations for more than half a century, is being renamed in order to identify it more closely with Aluminum Company of America, of which it has been a subsidiary since 1909. Incorporated in 1882, Republic was the first concern to mine bauxite in the United States, and it has been largely responsible for the development of the principal deposits in Arkansas.

★Deeds to mineral rights on land purchased from the State from Sept. 15, 1939, to Feb. 24, 1943, are now ready to be issued by the State Land Office. Under a legislative act passed this year, it is necessary for present titleholders to make affidavits on blanks furnished by the Land Office. The State has issued a total of 5,857 deeds in which mineral rights were reserved and which are now subject to issuance of deeds under the new act.

# WASHINGTON

### Metaline district operators negotiate new wage contracts—Aluminum production increased

★New labor contracts for operators in the Metaline district have been negotiated by American Zinc, Lead & Smelting Co., represented by D. I. Hayes, and Metaline Mining & Leasing Co., H. Louis Schermerhorn, president. The agreements include a vacation clause retroactive for 1944; also membership clause check-off for union dues and initiation fees; grievance procedure, seniority clause, and premium wage payments. These premiums are by shifts and are as follows: between 4:01 a.m. and 12 noon, regular scale; between 12:01 p.m. and 8 p.m., 4c per hour premium; between 8:01 p.m. and 4 a.m., 8c per hour premium; those working on shift 4, or intermediate shift, starting between 4:01 p.m. and 8 p.m., will receive premiums of 6c per hour. These scales started March 16, subject to the approval of the WLB. M. E. Travis represented the International Union of Mine, Mill & Smelter Workers, CIO; Jens Jensen, secretary of the Pend Oreille Mines & Metals Co., and Charles A. R. Lambly, superintendent, negotiated similar contracts for their company retroactive to Feb. 1, 1945, subject to the approval of the WLB.

★President H. Louis Schermerhorn of Metaline Mining & Leasing Co. reports an oversubscription of the offering of 400,000 shares of company's stock at 25c a share. The stock, which was subscribed to the amount of 619,000 shares, will be issued on a prorata basis, and buyers will receive approximately 65 percent of their subscriptions. The American Zinc, Lead & Smelting Co. will be paid $100,000, leaving the Metaline company indebted to American Zinc to the amount of a note for $50,000 due in two years from March 1, 1945. Litigation between the companies has been settled.

★Pend Oreille Mines & Metals Co. and Metaline Metals Co. have consummated their consolidation, the agreement being ratified by Metaline Metals Co. at a stockholders' meeting March 19. The latter company exchanges ten shares of its stock for each one share of Pend Oreille stock.

★The WPB has ordered a sixth potline opened at the Mead aluminum reduction plant just north of Spokane. The order was issued by Dewitt Wallace, district manager for the WPB, who stated that the need for aluminum metal in aircraft production has reached the most critical stage of the war period. At the same time WLB ordered an increase of wages of second- and third-shift workers, the increase to be 1c an hour on each shift. Putting the new potline into production has increased by 115 the number of men employed at the Mead plant. Altogether, 3,200 workers in the Spokane aluminum plants are affected by the wage increase. This order from the WPB, it was stated, would go into effect the middle of May and will bring the Mead plant of the Aluminum Company of America up to its full capacity of about 18,000,000 lb. of the light metal per month.

★Two records were established in March at the Mead aluminum plant. The green carbon plant produced 124 percent of its rated capacity, and the finished carbon plant at the rate of 121 percent capacity. Another record

was established at the Trentwood plant, where aluminum sheet is produced and where 2,800 men are now employed. In March enough aluminum sheet was produced and shipped to provide for 1,010 B-29 Superfortresses.

## OREGON

### Krome Corporation will ask for federal reimbursement to cover contract cancellation losses

★Quicksilver ore has been found in the Bonanza mine, east of Sutherlin, at a depth of 830 ft., according to superintendent C. G. Whelchel. The new orebody is apparently an extension of the main vein. The Bonanza is one of the large quicksilver producers of the United States.

★Reimbursement of creditors of Krome Corporation through an appropriation by Congress will be sought by C. F. Corzelius, company president, according to William E. Walsh, attorney for the company. Mr. Corzelius is undertaking this at his personal expense, asking for reimbursement of all losses suffered by the cancellation of the contract. In the meantime the company has decided not to sell all of its equipment at the plant in the Seven Devils district, as a fair market price is not now obtainable. Two 5 per cent liquidating dividends have been paid.

## IRON COUNTRY

### Shipping season opens—Rights of co-tenants and joint owners of land defined—Labor shortage

★The 1945 season for iron-ore shipping from Marquette, Mich., opened April 6, when three vessels of the Cleveland-Cliffs Iron Co. fleet arrived and were loaded at the Lake Superior and Ishpeming dock at Presque Isle. They were delayed 24 hours in Whitefish Bay, along with 20 other boats, due to one of the worst wind storms since 1940, according to Capt. J. L. Doud, skipper of the "Presque Isle," the first boat in. The wind reached a velocity of 75 miles per hour and blew the vessel about.

★On March 27 three Coast Guard vessels, the new ice breaker "Mackinaw," the "Sundew," and the cutter "Almond," started opening the Escanaba docks by crushing ice packs as far north as No. 6 ore dock. The steamers "Peter Reiss," "G. R. Fink," "Canopus," and "Durston" took cargoes of iron ore for Lake Erie docks.

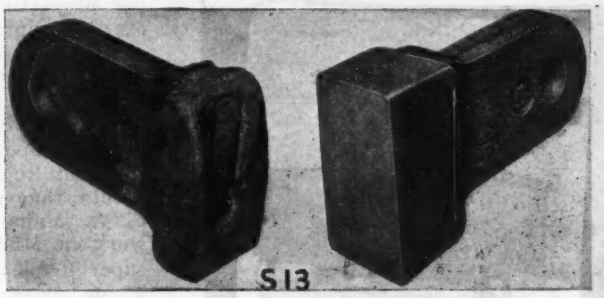
★At Port Inland, near Manistique, Mich., the steamers "Joseph Block" and "E. J. Block" arrived April 2 for loads of limestone. Last year this port


# *Metal Works Overtime* in the Tip of this Pulverizer Hammer . . .

Picture S-13 shows two Amsco-Clark renewable tip pulverizer hammers of original design (patent applied for); one new, the other after long service which has finally worn the tip off, exposing the hooks on the shanks that support the tip.

The new complete hammer weighs 110 lbs. (shanks 57½, tip 52½). The worn complete hammer weighs 73½ lbs. (shanks 57, tip 16½). 68.6% of the metal of the tip was worn away before the tip finally had to be replaced. With these manganese steel hammers, two-thirds of the tip is actually used, affording a great saving in discarded metal.

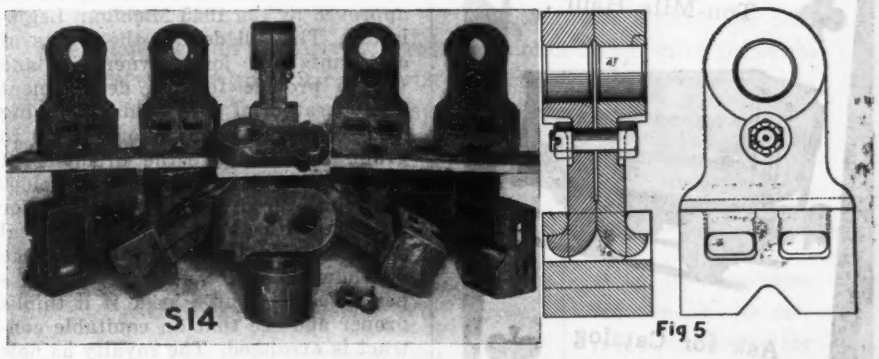
Such performance is possible only when the hammer is made of "the toughest steel known." The terrific impacts involved at high speeds which might fracture ordinary hammers and probably wreck the machine have only the effect of work-hardening austenitic manganese steel hammers and giving them a longer life than any other steel by enhancing wear resistance.




Picture S-14 presents Amsco-Clark pulverizer hammers of an improved design, which is shown in Fig. 5. The reversible tips of these hammers permit practically all the metal to be utilized.

The time required for removing old and replacing new tips in Amsco-Clark hammers is negligible. There is no guessing when tips need changing because the remaining shank-protecting metal is always visible. There is no operating stress on the shank bolt used to hold the assembly together. The tip cannot work or wear loose and come off the shank so long as the shank is on the supporting rotor pin.

Ask for Bulletin 642-C, which describes and pictures many types of Amsco manganese steel pulverizer, crusher and grinding mill parts.



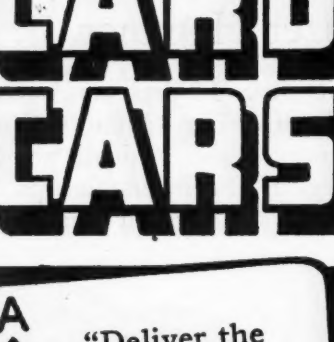

**Hammer heads and other pulverizer parts subjected to wear can be restored with Amsco Welding Rods; get bulletin 941-W.**

Amsco
AMERICAN MANGANESE STEEL DIVISION
Chicago Heights, Illinois
FOUNDRIES AT CHICAGO HEIGHTS, ILL.; NEW CASTLE, DEL.; DENVER, COLO.; OAKLAND, CALIF.; LOS ANGELES, CALIF.; ST. LOUIS, MO.
OFFICES IN PRINCIPAL CITIES

AMERICAN Brake Shoe COMPANY

CARD CARS

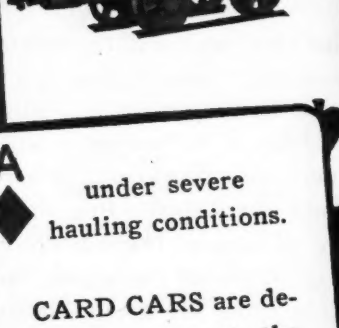
A ♠ "Deliver the goods"



A ♦ under severe hauling conditions.

CARD CARS are designed to meet the special conditions in your mine. They are "engineered to the job".

A ♣ "Lowest Cost Per Ton-Mile Haul".



Ask for Catalog 40 — Today

A ♣

C.S. Card Iron Works Co.
Denver, Colorado

## Iron Country *(Continued)*

opened March 28. The ore movement is heavy, and all operating mines on the Menominee range as well as Marquette district are shipping from both pocket and stockpile, due to stocks at Lake Erie ports being the lowest in four years, according to report from Lake Superior Iron Ore Association.

★R. C. Fish, formerly chief engineer on the Menominee Range for the M. A. Hanna Co., has been advanced to assistant general manager of all iron ore properties after serving as general superintendent of Minnesota operations for several years. Other promotions effective May 1 announced by E. E. Hunner, manager at Duluth, Minn., are: R. W. Whitney, formerly general superintendent of all operations for Butler Brothers on the Minnesota ranges, to replace Mr. Fish; S. A. Mahan, supervisor of safety work in Minnesota; J. G. Kleimola, superintendent, Mississippi and Argonne mines; W. F. Shinners, superintendent, Douglas mine; L. M. Kleimola, superintendent, Draper Annex mine; D. C. Pettyjohn, superintendent, Evergreen-Cuyuna properties.

★The Antrim Iron Co., of Mancelona, Mich., wound up a colorful existence when its sawmill closed April 15. Exhaustion of its timber holdings which once covered 30,000 acres, extending as far north as Petoskey, Mich., eliminated the smelting of iron ore with charcoal, which was a thriving business from 1886 to 1926. At the peak of its operations, about 1900, when the demand for hard maple was strong, the company employed over 500 men. Other products manufactured were methanol, acetate of lime, acetic acid, and wood tars. Over 8,000 acres of the company's former holdings have been purchased by the State Conservation Department to be included in reforestation projects.

★Due to widespread objection of Upper Peninsula mining men and fee owners, marked changes were made in the original form of the Lundquist bill approved by the 1945 Michigan Legislature. The bill defines the rights of co-tenants and joint owners in land (1) to provide for the development and operation of such land for mining purposes other than gas or oil; (2) to grant jurisdiction to the circuit court to authorize the exploration, development and operation of such land for mining purposes, and (3) to repeal all acts in conflict therewith. As the bill now stands, the circuit court is permitted to issue a lease if it thinks proper and see that an equitable contract is arranged. The royalty as now fixed is not less than 10 per cent of the value of the ore. There are now restrictions to methods of mining, and it is impossible for an operator to enter the property and ruin it for future operation; also provisions for payment of taxes or minimum royalty by the operator, and, finally, the owner has a right to know the grade of the ore and can inspect his property over the unwillingness of the operator.

★Iron-ore shipments from the head of the Lakes started on April 2, with shipments going forward from concentrate stockpiles produced last season, from shaft and underground stockpiles accumulated during the winter, and a few mines starting shipments direct from open pits. The first cargo to be loaded was the steamer "E. H. Gary," of the Pittsburgh Steamship Co. fleet, which loaded at the Two Harbors dock on April 3. The Hill-Annex plant of the Inter-State Iron Co. was the first concentrator to start washing ore in the 1945 season, production starting on April 12.

★Butler Brothers, Cooley, Minn., are busily engaged in the construction of a cone plant at their Patrick concentrator. This is a heavy-density plant designed for the use of ferrosilicon as a medium. They expect this addition to be ready for operation when the mine starts production for the season.

★With the opening of the ore season and the opening of navigation, the War Manpower officials at Duluth and on the Mesabi range state that approximately 1,000 men are needed to fill jobs in the mines, railroads, and ore docks. C. F. Mahnke, Duluth area director of the War Manpower Commission, stated "There is no excuse for any able-bodied man in this area being out of work today."

## MICHIGAN

### General wage increase denied by WLB—Isle Royale production in 1944 was 10 percent below 1943

★A proposed general wage increase of 30.6c an hour and corresponding increases in all other classifications for approximately 4,000 underground and surface workers of four Michigan copper companies were denied by the Eleventh Regional War Labor Board on the ground that the industry rate structure was firmly established at the present level, and employees had received all general increases permissible under the wartime wage stabilization policy. Companies involved were the Calumet & Hecla Consolidated Copper Co., Calumet; the Copper Range company (mining division), Painesdale; the Isle Royale Copper Co., Houghton; and the Quincy Mining Co., Hancock. The International Union of Mine, Mill and Smelter Workers, CIO, represented the workers in the dispute. The board ordered installation of a liberalized vacation plan, however, at the Calumet & Hecla, Isle Royale, and Copper Range mines; approved a differential of 4c for second-shift workers and 8c for third-shift workers at Quincy and Copper Range; directed inclusion of a standard voluntary maintenance of membership and automatic check-off

at Calumet & Hecla; and in the latter dispute endorsed a job evaluation plan proposed by both parties.

★Men in the age group from 26 through 29 years who are employed in copper mines, mills, smelters, and refineries have been advised to "stay on the job," for if they quit for any reason "they become subject to immediate induction." D. L. Forrester, chief of the primary production branch of the copper division of the War Production Board, conveyed this information in a telegram to the managements of the copper mines in the Michigan district. He said: "These men are most important for the war program by producing copper. We need the copper for ammunition, and must have it."

★Isle Royale Copper Co. produced a total of 5,706,178 lb. of copper in 1944, a reduction of just under 10 percent from the previous year, due to a considerable loss of labor. The most serious setback was the loss of practically all young men in the 19 to 25 age group to the armed forces in June. The yield of refined copper per ton of rock stamped was 18.344 lb., compared to 20.359 lb. for 1943. Production costs averaged 20.275c per pound. Depreciation and depletion totalled 1.447c per pound, making an over-all cost of 21.722c. As a marginal producer of copper, whose product is vital to the war effort, the output was purchased throughout the year by the Metals Reserve Co. under special contract. Amendments to this contract extended its life to April 30, 1945, and there is a good possibility that the premium-price plan will be extended beyond the present expiration date of July 31, 1945. If this is done, it is probable that the special contracts also will be extended through the year. The grade of rock developed was below the average of the previous year. In line with the general practice of the district, some attention was paid to the problem of reworking the Isle Royale's accumulation of stamp sands. Some experimental work was done, but the results were inconclusive. Further experimentation will be carried on this year. Isle Royale paid a dividend of 50c per share in 1944. Net income before depreciation and depletion was $158,060.40. Net profit was $80,449.54. Included in current assets are: Cash, $282,368.98; accounts receivable, copper, $150,000; other accounts receivable, $61.20.

## ALASKA

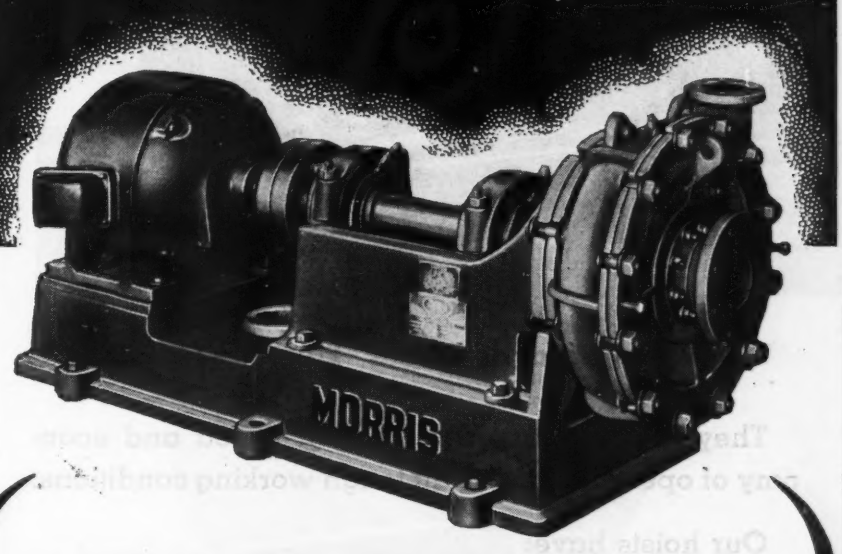
**Companies preparing to resume seasonal operations — Interest growing in mercury deposits**

★Forty persons have formed the Prospectors and Miners Society at Anchorage. Officers are L. E. Nappe,


*Pump More* Gallons per Year

*of heavier slurries . . .*

*at higher heads*




MORRIS

*Type "S"* SLURRY PUMPS

Morris Type "S" Slurry Pumps can dish it out—millions of gallons per week . . . of heavy, abrasive and corrosive slurries, tailings, concentrates . . . without choking up, without excessive friction, with a lower rate of efficiency-loss and a lower over-all cost than most.

They can take it, too. The running parts are simple and rugged, designed to withstand slurries with large percentage of solids. Suctions of large diameter, and impellers with easy entrance curves, reduce friction and abrasive action, the outstanding and exclusive "pressure balanced" impeller prevents destructive quantities of gritty particles from circulating between the impeller and the suction disc liner; reduces scouring action, lowers eddy losses, sustains efficiency and lengthens pump life. Disc liners and suction throat liners are easily renewed—thus tending to preserve maximum capacity and efficiency.

MORRIS MACHINE WORKS

*Sales Offices in Principal Cities*

Baldwinsville, N. Y.

● Let our engineers recommend the correct pump design for the sludge or slurries you handle. No charge. No obligation. Just write.

MORRIS CENTRIFUGAL PUMPS

**— with Stearns-Roger Electric Hoists**

**They're unsurpassed for safety, speed and economy of operation under all tough working conditions.**

**Our hoists have:**

- **Flexibility of operation.**
- **Frames sectionalized for easy handling thru a tunnel or shaft.**
- **Meehanite spur tooth drum gears, and herringbone, helical, or spur tooth intermediate gears. Forged steel drum and intermediate pinions.**
- **Self locking, steel band friction clutch with minimum safety factor of 10. Quickly adjusted with one turnbuckle.**
- **Either band or post brakes furnished, as required.**

**Inquire about the complete line of Stearns-Roger single and double drum hoists with greater lifting capacities.**

**Write for bulletin No. 2506. Stearns-Roger Manufacturing Company, Denver 2, Colorado.**

**Stearns-Roger**

THE STEARNS-ROGER MFG. CO. : DENVER, COLORADO

## Alaska (*Continued*)

president; John Ryan, vice president; Genevieve Miller, secretary; Elmer Danes, treasurer, and W. G. Culver, senior adviser. The constitution and bylaws state the objective of the Society is to secure practical knowledge of geology, prospecting, and mining, and to afford the members cooperation in obtaining information and experience in prospecting and mining.

★Gus Otilla and Victor Neck, with thirteen men, have gone to the South fork of the Koyukuk River and are installing a 1-yd. dragline to operate their property. It was once operated by a small dredge, which was abandoned because of difficulty in securing supplies. George W. Herbert, a 71-year old miner from Bettles, has been in Seattle arranging for machinery to develop his property. He says there will be considerable work done in that region as soon as government restrictions on gold mining are removed. Three airlines are operating into the district and will assist in the mine development. "There is a great opportunity there for men who have grubstakes, but flour at Bettles is $17 per 100 lb., sugar $25, and other groceries are at similar prices. No meat is to be had, but moose are plentiful, and prospectors may kill them for food when necessary," Mr. Herbert says.

★Andy Schasdall and John Repo have large development operations on Myrtle Creek which they will push this summer, according to Mr. Herbert, who says that besides gold there is much tin, cinnabar, and tungsten to be found in that district, with some platinum. Repo and Jack Allen have 10 miles of placer ground on Slate Creek, in the Koyukuk district, which they expect to drill this summer, using a Fairbanks airplane drill which they have flown into the district.

★George Lysell has driven a "cat" into the Fortymile district from the Alaska Highway. Bruce Thomas, with the U. S. Bureau of Mines, expects considerable activity in that district, and pioneers believe that Lysell has opened a route which will ultimately be made into a highway for that region, which has suffered for lack of transportation. "The only access into the country heretofore has been by airplane and by the highway from Dawson to upper Jack Wade," Mr. Thomas says. "This route would be about 80 miles long, starting from the bridge over Thomas River near Tok Junction, thence down Denison Fork into Chicken, down Fortymile to Uhler Creek, then up that stream to the road which comes out from Dawson." Lysell has proved with his tractor that a winter trail for freighting is feasible over this route. Supplies could be brought in entirely through American territory.

★E. N. Patty, chairman of the Alaska Committee of the Seattle Chamber of Commerce, at a recent meeting urged

that the Association endeavor to get Congress to pass a law which would prevent the Secretary of the Interior from gaining control of lands in the Territory by the establishment of reservations or otherwise. The Alaska legislature recently passed a memorial asking Congress to take steps of this kind.

★The Denali Development Co., of Seward, has moved its mining equipment to the Oscar Dahl property of 45 claims around Mile 49 and 50. Samuel Gamblin is one of the leaders in this organization.

★United States Smelting, Refining & Mining Co. has secured a permit from the War Manpower Commission to operate two dredges and employ 200 men this season. Employment is subject to war manpower restrictions on this type of labor. A similar permit was given the company last year with one dredge in operation.

★Cleary Hills Mines, R. E. Weir, Manager, is operating its gold-quartz mine about 25 miles from Fairbanks on a one-shift basis with a crew of 13 men. The mill is running 10 hours a day but will operate on a 24-hour basis when more miners can be obtained. This company closed its tungsten property last fall when the MRC discontinued purchasing concentrates in Fairbanks.

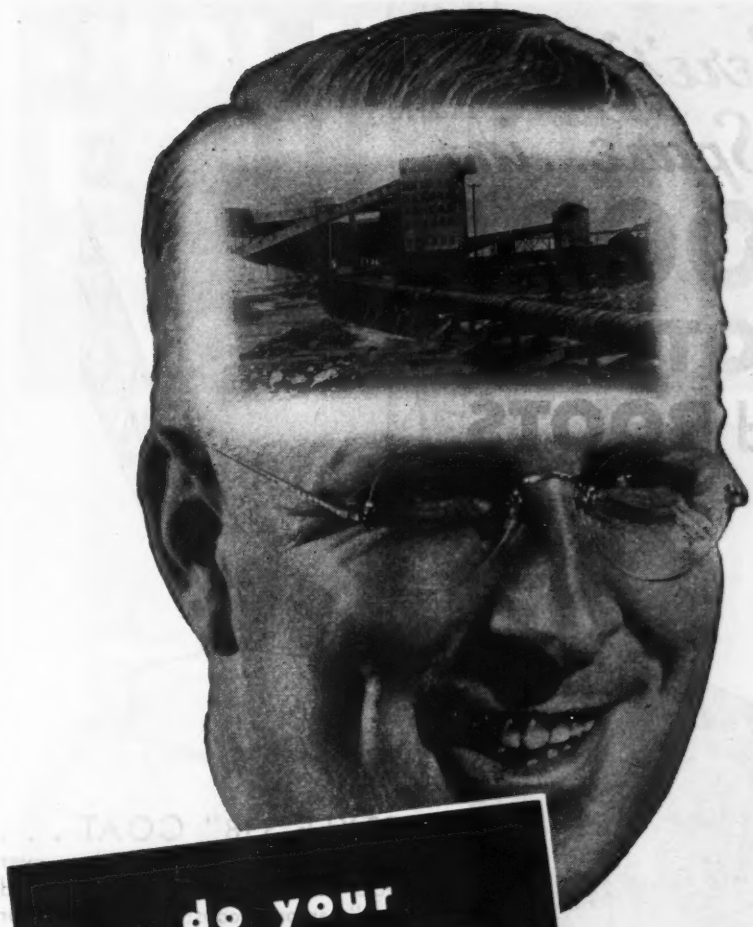
★The U. S. Geological Survey has opened an office in Fairbanks, and laboratory equipment is to be installed. Three field parties of the USGS and six Navy parties plan to start geological work in the Arctic Naval Reserve about the first of May.

★Two tin veins were uncovered by trenching on Cape Mountain at Cape Prince of Wales north of Nome this past summer. The work was accomplished as a joint project of the U. S. Geological Survey and the U. S. Bureau of Mines. The veins at present are not of economic importance.

★The Goodnews Bay Mining Co., Ed. Olson, manager, with platinum placer ground on Salmon River in the Goodnews Bay district, will operate its 8-cu. ft. bucket-dredge and dragline again this season. The company is the only important U. S. producer of platinum, and the government has granted it a high priority rating. A crew of 60 men has been obtained for the season's operations.

★A lead-zinc property in the Ground Hog Basin district east of Wrangell is to be prospected by Jerry Galvin this summer. A sawmill is being moved to the property to cut lumber for camp buildings and flumes.

★In a report to Secretary Ickes on the claims of Alaskan Indians to large areas of Alaskan land and water, Examiner Richard H. Hanna states that the hearings held last year failed to establish the claims originally presented. He also held, however, that the Indians have some aboriginal rights, and he recommended that these

do your MENTAL BUYING now!

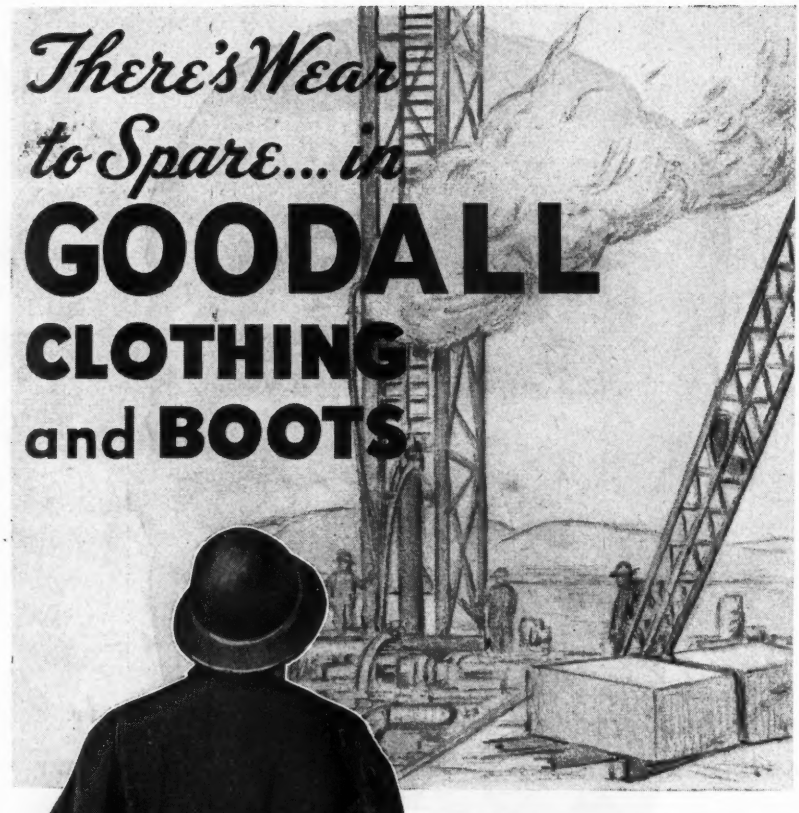
In making your post-war plans, you'll want to install the light-weight pipe that can give you the stepped-up performance required for more profitable operation.

No other light-weight pipe combines all the advantages of Naylor's exclusive Lockseam Spiralweld structure. You'll like its light weight. Its greater strength. Its speed of installation. Its leaktightness. Its extra safety. Its revolutionary coupling methods. Its savings, high salvage and re-use value. It will pay you to do your mental shopping now and include Naylor Pipe in your post-war plans.

Specify Naylor Pipe for high pressure hydraulic lines, high or low pressure air and water lines, de-watering, drainage, ventilating and sludge lines. Sizes from 4" to 30" in diameter, lengths up to 40 feet. All types of fittings, connections and fabrications.

NAYLOR LOCKSEAM SPIRALWELD PIPE

NAYLOR PIPE COMPANY
1243 EAST 92nd STREET, CHICAGO 19, ILL.
New York Office:
350 Madison Ave., New York 17, N. Y.



"STYLE 338" COAT . . .
Made of heavy gauge rubber over special tear-resistant fabric. Rated "tops" among construction men for durability and comfort.

"GOODALL" SHAFT SUIT
(Jacket, Style 80-D; Overalls, Style 81-D). Thoroughly waterproof dull finish rubber . . . "easy" to wear and made to take plenty of punishment.

"CHAMPION" SHAFT SUIT
(Jacket, Style 82; Overalls, Style 83). Slightly lighter in weight than above, but with plenty of long-wear quality.

"INDUSTRIAL" BOOTS . . .
Black, tough rubber, reinforced at flexing points. Durable, slip-proof soles. Short, three-quarter and full hip lengths, in all sizes.

"INDUSTRIAL TOE-SAVER" BOOTS . Same as above, plus patented steel box safety toe.

*CONTACT OUR NEAREST BRANCH OR MAIN OFFICE*

**GOODALL . . on the Job . . Longer!**

GOODALL
RUBBER COMPANY

THE GOODALL-WHITEHEAD COMPANIES
Philadelphia . Trenton . New York . Chicago . Pittsburgh . Boston
Goodall Rubber Co. of Calif. Goodall Rubber Co. of Texas
Factory — Trenton, N. J. Established 1870

WE ARE PARTICIPANTS IN THE OWNERSHIP AND OPERATION OF NATIONAL SYNTHETIC RUBBER CORPORATION


## Alaska (*Continued*)

be adjusted promptly through Congressional action or by the Secretary of the Interior.

## CANADA

### High-grade iron ore deposits in Labrador — A New Research Council in British Columbia — Mining companies report on 1944

★Settlement of labor disputes in mining camps has been making further progress. The CIO Miners' Union has signed collective bargaining agreements similar to that in force at Noranda Mines and effective for one year, with Lamaque Mines, in Quebec, and Leitch Gold Mines, in Ontario. No clauses are included for check-off, maintenance of membership, or closed shop. Both contracts are reported to be similar to the Noranda agreement, as are those under consideration at Waite Amulet and other mines in northwestern Quebec. Negotiations are being continued in the Porcupine camp. Renewal of contracts is being discussed at Sudbury.

★Nine deposits of iron ore averaging 63 percent are discussed in the annual report of Labrador Mining & Exploration Co. Difficult conditions for diamond drilling made it possible to complete only a limited number of holes, with the result that tests to a maximum depth of 220 ft. were made on the Sawyer Lake orebody. The average analysis of combined core and sludge indicated an iron content of 67.6 percent; phosphorus, 0.0116 percent. The ore has an apparent length of 2,200 ft. and apparent width of 150 ft. Chip sampling of eight other deposits has indicated an average grade ranging from 59.6 to 69.4 percent. All but one of these was reported by John Knox, general manager, to be of Bessemer quality. Field work since the summer of 1936 has been under the direction of Dr. J. A. Retty. Terms of a new agreement with Newfoundland have been outlined by Jules R. Timmins, president. The mining leases are renewable for a total of 90 years and no areas are to be abandoned until the end of 1952. In 1939, under terms of the original contract, 3,000 square miles of the large concession were relinquished. A new royalty provision allows Newfoundland 5 percent of net profits, rather than a percentage of production.

### ONTARIO

★Robert C. Stanley, chairman and president of International Nickel Company of Canada, has reported net profit for 1944 of $26,927,652, compared with $31,127,204 in 1943. The labor shortage was credited with reduced output and higher costs, as

compared with 1943, but strategic metals were supplied adequate to fill war demands of the United Nations. Sales of nickel, including metal refined for other operators, amounted to 285,238,333 lb.; copper, 314,684,817; selenium, 85,519; tellurium, 7,087. Other products marketed included platinum metals, gold, and silver. Capital expenditures in 1944 were $4,652,127, the amount estimated for 1945 being $6,000,000. Working capital at the end of 1944 was $106,710,611 and earned surplus was $82,931,158.

★Regaining and rehabilitating the refinery in Norway was stated to be the chief problem of Falconbridge Nickel Mines at the annual meeting in March. J. Gordon Hardy, who has resigned as president and has been succeeded by L. K. Brindley, reported that information early in February indicated the Kristiansand plant would close down within the near future. Rising costs at the Falconbridge mine in 1944 were offset by larger tonnage and better recoveries of both nickel and copper, in spite of the lower grade treated. Ore reserves increased to 12,669,500 tons averaging 1.72 percent nickel and 0.93 percent copper, representing the Falconbridge, Levack, and Mount Nickel mines. Ore reserves are adequate for ten years, with favorable possibilities for developing additional tonnage.

★Operations by Bidgood Kirkland Gold Mines in 1944 resulted in a loss of $69,085 before depreciation, president W. J. Lawson reports. Both tonnage and grade were lower than in the previous year. Limited exploration of the new No. 21 vein at the 1,400-ft. level disclosed an average cut grade of $14 a ton from muck samples representing a 219-ft. section, and development work on the vein is in progress. Mill recovery averaged $7.14 a ton, compared with $11.17 in 1943. Operations for the year resulted in a mill rate averaging 133 tons daily, only three tons lower than the 1943 average. Extraction averaged 89.9 percent, compared with 91.8 in 1943. F. L. Smith is mine manager.

★Ore reserves were maintained in 1944 by Central Patricia Gold Mines in spite of labor shortage, it was reported by F. M. Connell, president. Ore grade was reduced in the year from $13.65 to $12.34 and material put through the mill was down from 104,451 to 91,512 tons in 1944. Development was concentrated in levels above the 2,050-ft. horizon, leaving until after the war the area opened by the new internal shaft. R. E. Barrett, mine manager, discussed encouraging exploratory work at Miminiske Lake, 75 miles east of the Central Patricia mine.

## QUEBEC

★Since the spectacular drilling results on Frobisher's Giant Yellowknife property, no greater interest in Canada has been attracted than by the intersections of high-grade copper ore

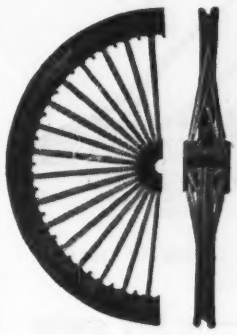

# •HOLMES EQUIPMENT

• *Designed for . . .*

# MODERN MINING

**45° Dump Cage**

Four point setting. In designing Holmes' all-steel cages, first consideration is given to proper distribution of the load, so that the weight is transmitted directly to the lower bail members.

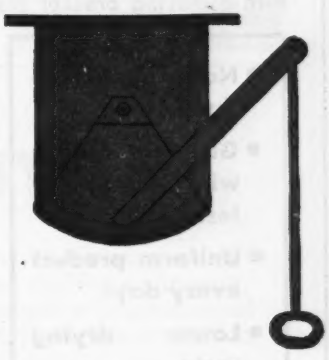


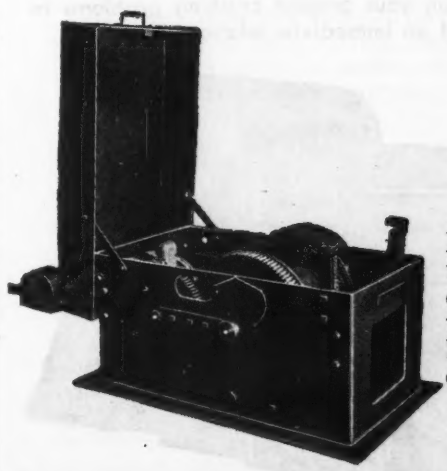
**Bicycle Type Sheave Wheels**

A light weight wheel, yet of strong section to avoid undue bearing wear and high inertia. Renewable liners, with bolts locked against turning or coming loose. Sizes, three feet to twelve feet in diameter.

**Holmes Bin Valves**

Fabricated welded steel plates. Gate quadrant balanced on steel pins. May be operated by pull rod or cables. Suitable for bottom discharge bins.





**Electric Car Retarder**

Designed to offer complete control over movement of cars under loading booms or chutes at tipple, without the use of sprags, brake, or other time wasting operations.

**ROBERT HOLMES AND BROS.**

BINS - GATES - LOWERING SPIRALS - DUST-O-LATORS - SHAKING GATES

DANVILLE, ILLINOIS

# MR. CLOG SCRAMS Everytime a DIXIE NON-CLOG HAMMERMILL IS INSTALLED

Mr. Clog, who is a KILLER of time and a trouble maker in general, need bother you no more.

The answer is in the DIXIE Non-Clog Hammermill—the only crusher with a moving breaker plate. Provides positive mechanical feed.

- **No delays in production**
- **Greater output with same or less power**
- **Uniform product every day**
- **Lower drying costs**

The most plastic, wet, clayey materials will not slow production. Has saved the cost of 10 men for one company.

And because the breaker plate is adjustable to the hammer points, quality and size of production can be controlled.

DIXIE engineers will gladly cooperate with you on your present crushing problems to effect an immediate solution.

**DIXIE MACHINERY MFG. CO.**

**4204 Goodfellow Blvd.** **St. Louis, Mo.**


## Canada *(Continued)*

in drill hole No. 10 on the property of Quemont Mining Corporation. Located under Osisko Lake about 600 ft, from the north boundary of Noranda Mines, ice hazards and boulders in the lake bed have prevented securing a detailed picture from supplementary drilling. Three holes were abandoned after gold and copper values were secured in No. 11 and No. 13 holes, and drill set-ups have now been made on the shore. The 900-ft. shaft, put down in the early days of the Rouyn camp, has a 500-ft. crosscut that is to be extended upwards of 2,100 ft. to intersect the newly discovered ore zone.

★N. W. Rice, president of Mic-Mac Mines, reports that production in 1944 amounted to 20,516 oz. gold, 667 oz. silver, and 797,800 lb. copper from the treatment of 177,967 tons of ore. Gross profit was $164,309, which became a loss of $40,101 after deductions. Demand notes of $443,000 remain outstanding after redeeming $125,000 last year. Controlled by United States Smelting, Refining & Mining Co., the property went into production in June 1942 with a 600-ton mill. Underground and surface exploration has failed to indicate extensions to the known orebodies. It was stated that only a short life can be estimated for the mine. Frederick W. Snow is mine manager and A. A. Nelson, mill superintendent.

★This summer a crew is being sent to the 235-mile concession held by Gulf Lead Mines in New Quebec, on the east coast of Richmond Gulf, Hudson Bay. M. E. Holtzman, president, states that lead ore has been exposed over a wide area. A test mill is to be installed when transportation facilities and priorities for equipment are available.

★At the annual meeting of Wasa Lake Gold Mines, C. H. D. MacAlpine, president, reported a true vein width of 16 ft. intersected by drill hole No. 132, located in the east ore section about 1,400 ft. from the main orebody. Exploratory drilling is being continued in this area, following the intensive program that has indicated substantial ore tonnage along the main Wasa Lake shear zone. D. H. McDougall, a director of Steep Rock Iron Mines and several other companies, was elected to the board, succeeding A. A. MacKay.

★Depth development on three new levels is proceeding at Powell Rouyn Gold Mines, following completion of deepening the main shaft, which was started early in 1944. It is necessary to run 1,000-ft. crosscuts to reach ore, from 2,100 down to the 2,600-ft. level. Labor shortage is responsible for cutting ore shipments to the Noranda smelter from the maximum of 27,000 tons monthly to 25,000 tons in the final quarter of 1944. The ore-reserve position a year ago showed up-

wards of 500,000 tons having an average gold content of 0.134 oz. per ton.

### BRITISH COLUMBIA

★The British Columbia Industrial and Scientific Research Council is directing special attention to its Scientific Extension Service from which industry may obtain information and assistance on technical problems. J. M. Cummings, metallurgist, who was loaned by the B. C. Department of Mines to become special assistant to the director of the Research Council, has already visited a large number of plants in the Province in an effort to learn what form of assistance can best be given to help in planning research programs. Arrangements are being made to absorb the research work in minerals and metals formerly carried on by the War Metals Research Board. A staff of research metallurgists will carry out this work in laboratories generously provided by the University of British Columbia.

★The following suggestions have been made by the British Columbia and Yukon Chamber of Mines in response to a request from the Hon. E. C. Carson, Minister of Mines, for such information to be considered for submission to the Inter-Provincial Mines Committee, in Quebec:

1. That the governments conduct a nation-wide campaign to interest more young Canadians in mining, emphasizing the social and favorable living conditions in mining camps.
2. That taxation exemptions for money spent on prospecting be increased and extended to include individual prospectors financing themselves; also to private parties financing prospectors.
3. That the federal government permit development of mines, but not smelters, in National Parks. It is felt a mine is an attraction and would benefit these parks.
4. That laws governing formation and activities of public mining companies and syndicates be simplified.
5. That representatives of Chambers of Mines, representing the prospectors, be nominated to sit on all government mining committees.
6. That subjects relating to mining be taught in public and high schools.
7. That the Dominion Government again consider bringing into force the three-year exemption from income or corporation taxes in the case of new gold mines coming into production.
8. Strongly urge establishment of an iron-and-steel industry in British Columbia, utilizing local materials.
9. That no change be made in the mining laws unless requested by the mining industry.
10. Re-establishment in British Columbia of resident mining engineers to assist prospectors in the field.
11. Annual reports of the B. C. Minister of Mines be changed back to the former style, which was especially useful to the mining industry.

★Production of Silbak Premier Mines,

**Here's why Deltabeston performs with the utmost dependability where many other cables soon become unfit for service.**

1. Very soft, small copper strands—for greater flexibility and to withstand vibration.
2. Heatproof felted asbestos—for protection against overload conductor heat.
3. Varnished cambric—for moisture resistance and high dielectric strength.
4. Felted asbestos—for extra protection against high ambient temperatures.
5. Asbestos braid—for high resistance to heat, moisture, oil, grease and most corrosive vapors.



# REWIRE WITH DELTABESTON

Are heat, moisture and corrosive vapors causing unexpected cable failures in your cutting, hauling and loading equipment? Everytime an electrical cutter, mine locomotive or mechanical loader is hauled to the repair shop, urgently-needed production suffers.

Production losses due to power failures can be cut to a minimum by rewiring with Deltabeston Apparatus or Motor Lead Cables. These asbestos-insulated cables are designed for wiring low-voltage apparatus in mines, collieries and in other installations where difficult operating conditions are encountered. Deltabeston is highly resistant to heat, flame, moisture, oil, grease and most corrosive vapors.

For additional information write to Section Y-551-30, Appliance and Merchandise Department, General Electric Company, Bridgeport, Conn. Deltabeston Wires and Cables are distributed nationally by Graybar Electric Co., General Electric Supply Corp., and other G-E Distributors.

***BUY WAR BONDS AND KEEP THEM***

**GENERAL ELECTRIC**

AND . . . IN *five* MINUTES . . .

this DUGAS EXTINGUISHER will be ready for the NEXT FIRE!

● You need never be unprepared for a second fire when DUGAS Fire Extinguishers are used . . . because you can *EASILY, QUICKLY* recharge them, on the spot.

As soon as one fire is killed, you have only to refill the chamber with PLUS-FIFTY DUGAS Dry Chemical, slip in a fresh cartridge, and IMMEDIATELY you're ready for the next, which might occur *ANYTIME.*

DUGAS Extinguishers require minimum maintenance, because they need no periodic recharge. In arctic cold or tropic heat, they retain their fire fighting effectiveness.

Easy to handle and operate . . . these portable DUGAS Extinguishers give the fire fighter maximum protection, because the dry chemical rolls up a heat-shielding screen in front of him as he moves in to snuff out the fire.

Constant fire protection like this can be yours. Write today for further information.

*Approved by Underwriters' Laboratories, Factory Mutual Laboratories, and Governmental Agencies.*

AN ANSUL PRODUCT
duGas
THE MASTER OF FLAME

DUGAS 15-T HAND EXTINGUISHER

DUGAS 150 WHEELED EXTINGUISHER

ANSUL CHEMICAL COMPANY, MARINETTE, WISCONSIN
DUGAS DIVISION


## Canada *(Continued)*

Ltd., during the year ended Dec. 31, 1944, was 15,289 oz. gold, 115,400 oz. silver, and 3,189,245 lb. lead, valued at $625,670, from 68,493 tons of ore, averaging 0.24 oz. gold, 2.06 oz. silver, and 2.98 percent lead per ton. After operating expenses of $497,352; administrative costs of $8,300; and provision of $17,600 for taxes, $20,113 for depletion, $2,099 for depreciation, and $1,206 for amortization of mine development, net profit for the year was $31,535. Dividends paid shareholders aggregated $125,000. Exploration and development amounted to 600 ft. of drifting, crosscutting, and raising.

★During the year ended Dec. 31, 1944, Premier Border Gold Mining Co., Ltd., obtained excess of revenue over expenditure of $14,762. This amount was applied in repayment of advances made by Silbak Premier Mines, Ltd., reducing the balance outstanding at the end of the year to $10,803.

★Diamond drilling is certainly in progress at the Venus and Venus Fraction mineral claims on Lasqueti Island, Nanaimo mining division. The properties are owned by Santiago Mines, Ltd.

★Production of Bralorne Mines, Ltd., Lillooet mining division, during the fiscal year ended Dec. 31, 1944, was valued at $2,684,625, and was obtained from treatment of 109,751 tons of ore, averaging 0.662 oz. gold per ton. Other income was $3,129. Cost of production was $803,138; shipping and delivery charges, $40,645; community welfare service, $44,271; and administrative and general expenses, $56,832. Write-offs included $50,376 for depletion, $50,000 for depreciation, and $407,211 for taxes. Net profit for the year was $1,235,281, equivalent to $1.02 per share. Dividends paid shareholders aggregated $1.20 per share, necessitating distribution of $1,496,400. Development work consisted of 5,435 ft. of drifting and crosscutting, 938 ft. of raising, and 4,862 ft. of diamond drilling. Ore reserves as of Dec. 31 were estimated at 1,100,000 tons averaging 0.514 oz. gold per ton, not including 195,000 tons of lower-grade ore, averaging 0.20 oz. gold per ton.

★During the early part of the operation of the Takla mercury mine, ore of comparatively low grade was mined. However, in the last two months, ore averaging 17 lb. quicksilver per ton was treated, providing a monthly output of more than 300 flasks. Total production in 1944 was 1,631 flasks. As operations under the rapidly declining open-market price for the metal, after cancellation of the Metals Reserve contract, would have resulted in a loss, the Takla mine was shut down on Sept. 11, 1944.

★Quebec Gold Mining Corporation has exercised its option on the P. E. mine, adjoining Pioneer on the south, and has incorporated a new company

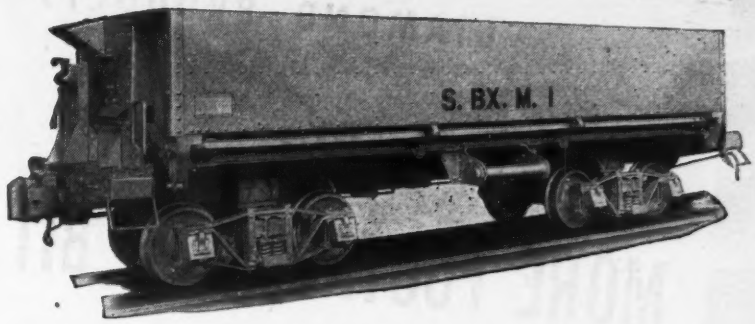
to be known as Pacific (Eastern) Gold Mines, Ltd., to acquire title to the property and continue development. Quebec Gold has also organized Pellaire Mines, Ltd., to hold title to and develop a group of 51 claims on Fall Creek, a tributary of Lord River, headwaters of Taseko Lake, Clinton mining division. A third incorporation resulting from the explorations of Quebec Gold is that of Kenville Gold Mines, Ltd., which will continue the work of Livingston Mining Co., Ltd., at the old Granite-Poorman mine, in the Nelson mining division.

★During the fiscal year ended Dec. 31, Granby Consolidated Mining, Smelting & Power Co., Ltd., earned a net profit equivalent to 37c. per share, before providing a reserve of $150,000 for deferred development. This compares with 28c. per share in 1943 and reflects the material reduction in operating costs due to the adoption of diamond-drill blast-hole methods. Ore reserves as of Dec. 31, 1944, were estimated at more than 12,000,000 tons averaging between 1.2 and 1.3 percent copper, sufficient for approximately seven years' capacity operation. Net current assets were increased by $380,528 to $1,751,825. The annual report states the company can operate at a daily rate of 3,000 tons if present copper prices and manpower supply continue to obtain. On this basis it is considered possible at least to break even, at the same time maintaining the properties and plant in good condition for a full-scale resumption when normal times return. Dividends aggregated $135,070 (U. S. funds) equivalent to 30c. per share.

### MANITOBA

★Operations of Hudson Bay Mining & Smelting Co., Ltd., at Flin Flon during the year 1944 resulted in a profit of $5,692,084, equivalent to $2.06 per share. Gross income for the year was $23,695,322. Ore milled amounted to 2,090,153 tons, from which were produced 92,048,171 lb. of copper, 113,103,040 lb. of zinc, 147,171 oz. of gold, and 2,069,570 oz. of silver. Because of shortage of labor only a limited amount of mine development and exploration work could be done, and though the results of the work undertaken were satisfactory, development work has of necessity lagged behind the amount which should have been done in relation to the tonnage of ore mined. The principal development work consisted of drifting on the 2,210 and 2,750 levels; the completion of the south main shaft to the 3,500-ft. level; and a small amount of drifting on the 3,250 level. The 1422 winze at the north end of the mine was deepened to a point 137 ft. vertically below the 2,750 level. Stope development work during the year amounted to 19,834 ft., of which approximately one-third was done below the 2,210-ft. level. Additions and improvements in the plant include installation of another air

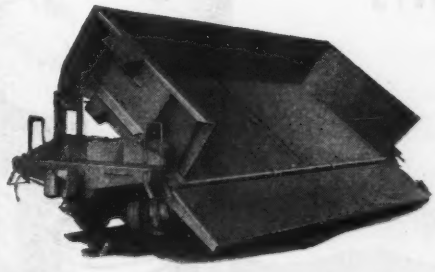

Steelcar MODERN




ALL-STEEL
AIR DUMP CARS
*. . . for greater efficiency in handling* BAUXITE ORE

- 14.5 cubic yards level capacity
- 19 cubic yards with average 30° heap
- Load carrying capacity, 45,000 pounds

Small hand dump cars were originally contemplated at this open-cut bauxite ore mine in South America but on the recommendations of Pressed Steel Car engineers, a larger car was substituted with the result that instead of hundreds of small cars, less than half the number were required to handle the full output of the mine. Thus the initial investment in cars was substantially reduced and worthwhile savings year after year were achieved in operating and maintenance costs.



These cars are dumped by a single pneumatic cylinder installed at the hopper leading to the primary crusher. Bulletins on request.

*Designers and Builders of Railway Cars Since 1898*

PRESSED STEEL CAR COMPANY, INC.
INDUSTRIAL DIVISION
PITTSBURGH, PA.

SINTA-SET
DIAMOND PRODUCTS
for
MORE FOOTAGE PER BIT
LESS BIT COST PER FOOT
CORE BITS
CASING BITS
REAMER SHELLS
SEGMENTS
CARBOLOY COMPANY, INC.
11193 E. 8 MILE BLVD. . . . DETROIT 32, MICHIGAN
SALES AGENTS
Caird Engineering Works, Helena, Montana
Canadian General Electric Co., Toronto, Ont.
Christensen Diamond Products Co., Salt Lake City, Utah
International General Electric Co., Schenectady, New York
E. J. Longyear Co., Minneapolis, Minn.
Sprague & Henwood, Inc., Scranton, Penna.

## Canada *(Continued)*

compressor; revision of the cadmium plant to provide better and safer operating conditions; various changes to improve working conditions in the smelter; and installation of a new coal dryer and a new coal storage silo to make the pulverized-coal system more efficient, particularly during periods of high coal moisture. The contract with the British Ministry of Supply covering the exportable surplus zinc production is still in force, but the copper contract terminated Jan. 31, 1945, since when the United States government has been purchasing the exportable surplus copper production. The average number of employees during 1944 was 2,074, compared with 2,217 in 1943. There were 235 women on the payroll at the end of the year. W. A. Green is general manager.

★Cuprus Mines, Ltd., in which Hudson Bay Exploration & Development Co. holds a majority interest, has completed plans for the sinking of a 600-ft. exploration shaft on the Thompson property, 8 miles southeast of Flin Flon. Exploration to date has indicated a mineralized schist zone 3,000 ft. in length containing four small lenticular copper-zinc orebodies of good grade. J. P. Caulfield is general manager.

★Mining of all the known ore in the old Mandy mine, near Flin Flon, was completed by Emergency Metals, Ltd., a subsidiary of Hudson Bay Mining & Smelting Co., Ltd., and operations ceased on Dec. 30, 1944. An active exploration campaign carried out during the year failed to disclose any new orebodies. During the year 62,227 tons of ore was milled, assaying 5.52 percent copper and 12.7 percent zinc, together with some gold and silver. At the completion of mining operations the pumps were removed after all salvageable material was recovered. The headframe is being removed to the Thompson property for sinking an exploration shaft. J. P. Caulfield is general manager.

★San Antonio Gold Mines, Ltd., at Bissett, produced bullion to the value of $1,568,476 in 1944. After providing for depreciation and taxes, net profit amounted to $468,024, or 19.56c per share. Ore milled totaled 140,085 tons averaging 0.2985 oz. per ton, and from this, 40,668.57 oz. bullion was shipped. As the labor force became smaller, the milling rate declined, until at the close of the year it was down to 380 tons per day. Because of curtailed development work, ore reserves declined by 6 percent during the year, and at Dec. 31, 1944, stood at 860,000 tons. Deep drilling below the present bottom 16th level showed that favorable structure exists for at least five more levels, or 750 feet below that level. Since the start of production in May, 1932, the mill has treated 1,479,181 tons averaging approximately $10.71 per ton, and has pro-

duced 442,944 oz. of gold. C. F. Caswell is mine manager.

### YUKON

★Yukoners are confident the expected removal of the ban on gold mining will greatly stimulate mining in the Province. Last year 300 miles of placer streams were staked by men who believe they will be permitted to operate their properties. W. J. Langham, one of the owners of the Laforma group, in the Carmacks district, says plans are ready to start operations as soon as permission is given, and that capital is available. The future of the Yukon is considered bright, partly because of the Alaska Highway, and also because of the use of airplanes in reaching the Province. The Chamber of Mines, at Dawson, has succeeded the Dawson Board of Trade and Business Mens' Association.

★Yukon Consolidated Gold Corporation, Ltd., now has the Lone Star, between Bonanza and Eldorado creeks, and expects to start operations as soon as men can be had.

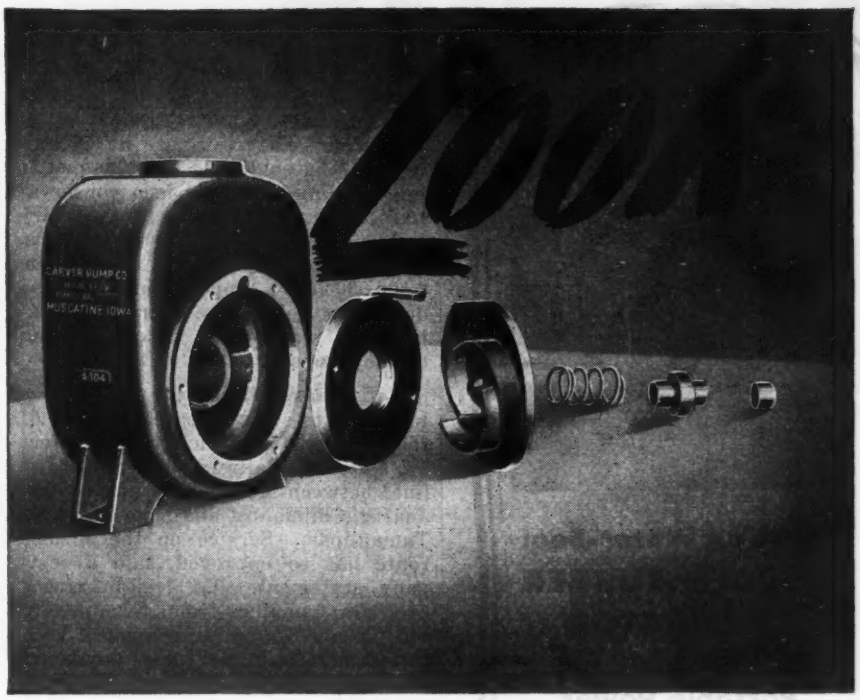
★C. E. McLeod, secretary of Yukon Consolidated Gold Corporation, says the company is prepared to continue operations on Klondike creeks. In 1944 he says the company's three dredges, Nos. 3, 4, and 7 produced $619,813 operating in low-grade ground. They employed as many as 172 men. They stripped ground on Quartz, Creek, Dominion Creek, and Hunker Creek. At top production 700 men are employed. An agreement with the Dawson's Miners' Union, an affiliate of International Union of Mine, Mill and Smelter Workers, CIO, is in force until Sept. 1, 1945.

## MEXICO

**More silver money minted—Rail transport improved—Mineral industry expansion recommended**

★The mint has lately stepped up output of silver pesos and half-pesos, it is learned at the Ministry of Finance. Explanation of this in official circles was that the increased production is to afford more metallic money for circulation. Officials believe that about enough paper money is going the rounds, and there is currently more silver available for minting, a circumstance that is common in the early months of the year.

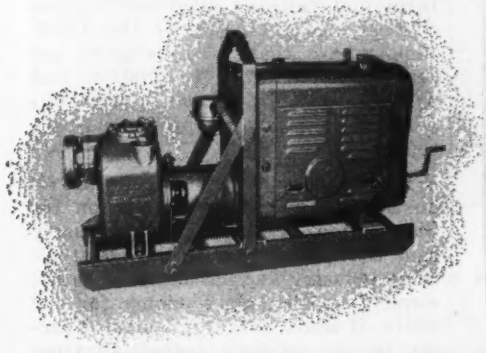
★Copper properties at La Dicha, Guerrero, first exploited from 1902 to 1907 by Mitchell Mining & Smelting, an American enterprise, then reopened in 1923 by another American firm, which was forced to stop operations because of the De La Huerta revolt, are now in favorable position, according to Dr. William F. Foshag, American mining geologist, and Ing. Genaro Gonzalez Reyna, Mexican mining en-


**...how simple they are!**

There are fewer parts in Carver pumps because every part does its job right. No gadgets have to be added to step up efficiency or correct faults. Impellers are scientifically designed with web-reinforced vanes confining wear to but one side. Renewable liners carry a cast lug protecting the scroll casing at the impeller cut-off where wear is greatest. The wearing surface seal rings of the Carver Lifetime Seal are made of Tungsten Carbide—a material so hard it cuts glass like a diamond.

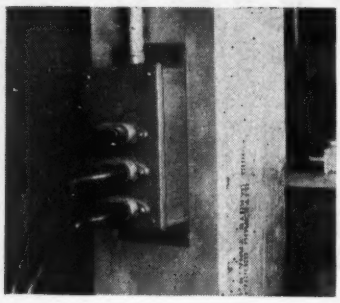
Every Carver Pump carries a "Certified" tag which means that it has been carefully tested and fully meets our high standards for performance on the job. Write for details or see your local distributor.



**THE CARVER PUMP CO.**
**Muscatine, Iowa**

**CARVER CENTRIFUGAL Certified PUMPS**

*Photo shows multiple distribution center application of Mines Molded Rubber Connectors.*



**There's a Water-Seal MOLDED RUBBER CONNECTOR Designed For Any Portable Power Supply Application**

Many types and sizes of Mines Molded Rubber Connectors have been developed, making them adaptable to almost any application where power is transmitted by portable cable. Stationary receptacles are also available for each portable type.

Molded on the desired cable length for the work to be done, Mines Cable Connectors become a part of the cable itself.

The spring pressure female contacts and the water-seal assure you a safe, positive connection with the male connector for efficient power supply to any machine under all plant conditions.

Mines Water-Seal Connectors are available in single conductor and multi-conductor types.

Our engineers will gladly work with you in solving portable power transmission problems on capacities up to 5000 volts and 325 amps.

*Write for Bulletin MC-106.*

**MINES EQUIPMENT COMPANY**

4265 Clayton Avenue
St. Louis 10, Missouri


## Mexico *(Continued)*

gineer, who reported to the mines department of the Ministry of National Economy after long examination of La Dicha. They estimate La Dicha's copper content at 5,100,000 metric tons, adding that this is a conservative calculation. Other estimates vary from 4,000,000 to 75,000,000 tons. Mitchell was said to have mined some 3,000,000 lb. of copper from La Dicha during its nearly five years of operation. It was forced to quit during the depression of 1907.

★Rail transportation for mining has improved to some extent by reason of faster freight scheduled put into effect by National Railways on two trunk lines between Mexico City and Ciudad Juarez, Chihuahua, and Nuevo Laredo, Tamaulipas. Service on the former route has so improved, said a company statement, that freight trains are now running from terminal to terminal in four days, compared with the former 20 or even more days, and like faster time is being made on the Mexico City-Nueva Laredo run. This accelerated service is rapidly reducing stockpiles of freight, including mining products, at stations along both routes.

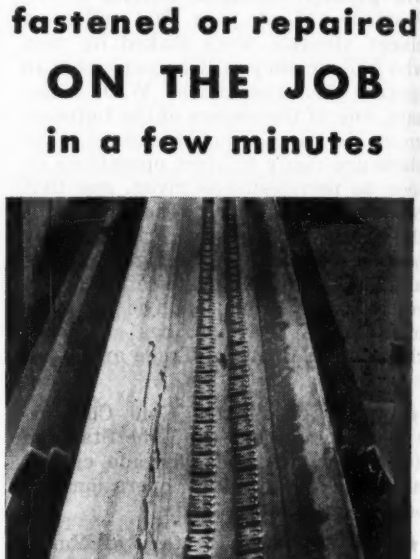
★Lack of sufficient railroad freight cars obliged Altos Hornos de Mexico, S.A., the iron and steel works that recently started at Monclova, Coahuila, to shut down its rolling departments temporarily. The condition forced a stockpile of 3,000 tons upon the company and delayed deliveries to domestic and export buyers. Other departments were able to continue functioning.

★Temporary but profitable relief for 1,000 unemployed Guanajuato miners, made jobless by suspension of work of some mining companies and the reduction of working staffs by others, was found by Governor Humberto Hidalgo and the national miners union, by enrolling these men in the farm and railroad labor contingents that Mexico is supplying the U. S. Reports are that these laborers are sending home between 3,000,000 and 4,000,000 pesos ($615,000 to $820,000) a month, a big thing for Guanajuato economy.

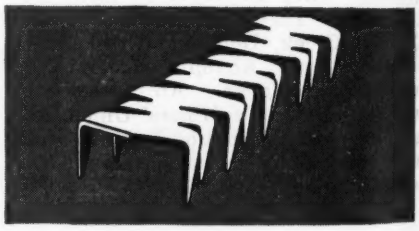
★Reviewing the Mexican mining industry, the National Commission for Stimulation of the Mining Industry said that as mining is the country's basic industry and has been the prime element in Mexican economy for 400 years, it must be a fundamental factor in the nation's industrialization program. Gold, silver, copper, lead, and zinc constitute 94 percent of Mexico's mining production, their subsidiaries 3 percent and their nonassociates another 3 percent of the total, the Commission said. It valued Mexico's annual mining production at around 600,000,000 pesos ($125,000,000) and reported that more than 100,000 persons are engaged in mining


**CONVEYOR BELTS**

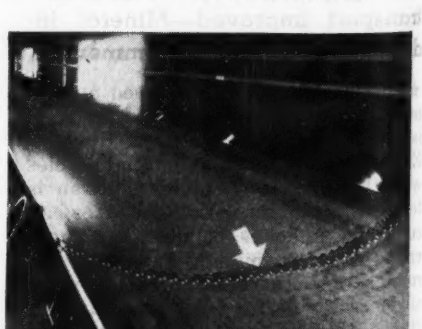
**fastened or repaired ON THE JOB in a few minutes**



**All you need are hammer, block of wood and . . . .**



**BRISTOL'S BELT LACING**



**For rubber or woven conveyor belts up to 13/16" thick. Write for Bulletin 736.**

**THE BRISTOL COMPANY**
Mill Supply Division
135 Bristol Road, Waterbury 91, Conn.
DISTRIBUTORS EVERYWHERE

in Mexico. Mine freight accounts for about 20 percent of the total tonnage hauled by the National Railways and contributes 12 percent of the railroad's income, the review said.

★The Commission expressed regret that only a very small amount of Mexico's mining production is fabricated in this country and asserted that this treatment is demanded by national economy, as it would claim important investments of capital, afford thousands employment, and allow a steady market for other Mexican products. It pointed to government aid to mining with the establishment of treatment plants and encouraging various kinds of mining enterprises in different parts of the Republic. The review stresses improved transportation, especially rail, as a vital contribution to the benefit of mining. It recommended increased production of tungsten, vanadium, and molybdenum to assure greater and sustained output of steel. Another recommendation was locating and working new mineral zones to sustain the industry; also seeking bauxite deposits, to provide aluminum for Mexican industries and for export.

## AFRICA

### New Modderfontein gives notice of intent to close—Deep level committee recommends dry mining and material tax relief

★After a life of over fifty years, New Modderfontein Gold Mine has given statutory notice of the possible cessation of mining operations, because they are becoming almost unprofitable due to high costs.

★Of three companies which early last year gave the statutory notice of the probable cessation of mining, Witwatersrand Deep has already ceased operations, and Langlaagte Estate and Van Ryn Deep are now engaged in the mining of safety pillars and remnants, which constitute the remaining ore. Geldenhuis Deep gave notice much earlier, and though it has been possible to maintain operations for a longer period than at one time seemed probable, the sources of remaining ore are nearing exhaustion, and, as the chairman stated at the last annual meeting, even a relatively small increase in working costs would immediately render further operations unprofitable. At Modder Deep, which has been in liquidation for a long period, the end of operations is now very clearly in view.

★H. F. Oppenheimer, in his address to shareholders at the annual meeting of Rand Selection Corporation, revealed for the first time the result of drilling now being conducted by Western Ultra Deep Levels. The geological deductions given by Mr. Oppenheimer


RYERSON STEEL IN STOCK

Call Ryerson for any kind, shape or size of steel you need. Steel for manufacturing, maintenance or construction ...all products are available for immediate shipment from any one of the ten convenient Ryerson Steel-Service Plants. Ask for a stock list...your guide to steel.

Principal Products Include:
Bars • Shapes • Structurals
Plates • Sheets • Floor Plates
Alloy Steels • Tool Steels
Stainless Steel • Screw Stock
Wire • Mechanical Tubing
Reinforcing Steels • Shafting
Babbitt • Nuts • Bolts
Rivets • Welding Rod • Etc.

JOSEPH T. RYERSON & SON, INC.
STEEL-SERVICE PLANTS AT: CHICAGO, MILWAUKEE, ST. LOUIS, DETROIT, CLEVELAND, CINCINNATI, BUFFALO, BOSTON, PHILADELPHIA, JERSEY CITY

LINN HAFTRAKS
WITH FULLY ENCLOSED OR OPEN CABS

THERE is a type of cab and body for any service, in any climate. The built-in strength and balance, with ample power, permit the rugged Linn Haftraks to carry their loads in all kinds of weather—the world around, the year around. Linn Haftraks and Traktrailers are built from 5 to 50 tons capacity. Send for catalog.

THE LINN MANUFACTURING CORPORATION
Morris New York

DESIGNERS AND BUILDERS OF OFF-THE-HIGHWAY VEHICLES FOR 29 YEARS.

# ADECO
## NOZZLE TESTER
*Keeps Diesel Engines Running Efficiently*

**TESTS FUEL INJECTORS AND HYDRAULIC DEVICES At Pressures Up To 10,000 p.s.i.**

To keep diesel engines operating at peak efficiency, this portable, precision-built Adeco Nozzle Tester is indispensable.

Light in weight yet built for heavy-duty service, it enables any mechanic to make quick, accurate tests on injector opening pressure, spray pattern, etc., and detect stuck needle valves and leakage around valve seats. Tests both large and small injectors, on bench or engine, at pressures up to 10,000 p.s.i. Prevents costly delays and possible damage to engine.

Ideal for testing hydraulic devices.

**Write for bulletin on this practical, low-cost unit.**

ADECO

**AIRCRAFT & DIESEL EQUIPMENT CORP.**
4411 NO. RAVENSWOOD AVE.
CHICAGO 40, ILLINOIS


## Africa *(Continued)*

are of considerable importance and interest as an indication of the economic potentialities and practicability of conducting mining operations at great depths. The Western Ultra Deep area which is now being explored lies to the south of Blyvooruitzicht and Driefontein on the West Wits line. Two boreholes were started in this area, but as one of these met with difficulties and is still in dolomite, Mr. Oppenheimer's statement was concerned principally with the progress of the second borehole, which, he said, had reached 5,500 ft., or more than half its contemplated depth. At 5,203 ft. the drill had passed from the Ventersdorp lavas (encountered at 5,098 ft.) into quartzites of the Kimberley-Elsburg series. Immediately below the base of the Ventersdorp lavas a contact reef was encountered and the assay showed 4.86 dwt. over 24 in. (117 inch-dwt.). Whether this reef has economic potentialities it is impossible at present to know, said the chairman, but its existence is certainly encouraging.

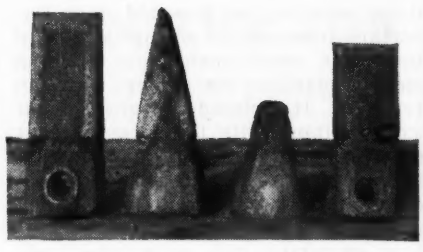
★The Minister of Finance proposed, in presenting his budget, to appoint an inter-departmental committee, similar to that of 1935, to investigate the system of gold mining taxation as a whole, which is held in mining circles to be a step in the right direction. It was as a result of the findings of the 1935 committee that the present complicated formula for assessing the mines was adopted. It would appear, therefore, that the Minister has in mind a simplification of the existing scheme.

★The report of the commission appointed to advise on technical aspects of mining at deep levels has been tabled in the House of Assembly by the Minister of Mines. This committee consisted of Sir Robert Kotze, a former government mining engineer; H. S. H. Donald, the present government mining engineer, and H. R. Hill, who recently retired from the position of manager of the Union Corporation, Ltd.

"A vigorous campaign of practical experiment into the possibility of dry mining should be initiated" and the committee recommends to the government the appointment of a committee of experts consisting of representatives of the mining industry, the Mines Department, and the medical profession, with the government mining engineer as chairman. The committee suggests the provision of £30,000 for the first year for the investigations and experiments contemplated, which could best be carried out by an organization which might be styled "The Rand Mining Research Institute" and constituted somewhat on the lines of the South African Institute for Medical Research.

Every effort should be made, says the report, to ascertain whether dry


## *Your Worn Dipper Teeth Are Still*
# "Good as Gold!"



*From left to right:* (1) Ready for service,—bucket tooth hard-faced along sides and at point after new tip has been welded on worn tooth. Note hard-facing protection around hole. (2) The same tooth, side view. (3) Typical worn tooth. (4) The same after welding on a new tip.

DON'T DISCARD old bucket teeth,—no matter how badly worn. Rebuilding and hard-facing with Coast Metals will make them good as new,—at less than half the cost of new replacements!

In fact, Coast Metals Hard-Facing makes your power shovel and bucket lips and teeth *better than new,* since they will outlast and outwear ordinary unprotected lips and teeth several times. You can use Coast Metals Hard-Facing also for minimizing wear on tractors, dirt movers, rooters, rippers, crushers and other earth-moving and road building equipment.

Patented Coast Metals Hard-Facing alloys are easily welded to all ferrous metals, including manganese steel, alloy steels, cast iron and chilled iron. Write for full details.

COAST METALS, INC.
*Plant and General Offices:* Canton, Ohio
*Executive Offices:* New York, N. Y.

# COAST METALS
*hard-facing weld rods*
MAKE YOUR EQUIPMENT LAST LONGER

mining can be carried on without causing silicosis. "It is worth while spending very large amounts in an attempt to ascertain whether it will be possible to exploit deep-level ore of the value of a couple of hundred million pounds." In the committee's view, wet mining has been justified by its results, but "it is today the great obstacle to the exploitation of a vast tonnage of rock lying at depths which can certainly not be reached unless dry mining is made feasible. It is possible that methods of dry mining may be developed which do not involve the inhalation of dangerous quantities of siliceous dust and that ameliorative measures, such as the treatment by aluminum dust, may be of great assistance in solving the problem."

Dealing with difficulties due to pressure, the report says: "The effects of the weight of the superincumbent mass or rock overlying the workings become more and more apparent and steps have to be taken to meet the difficulties which arise." Rock pressure at great depths also introduces difficulties in shaft sinking, but "we are inclined to the view that if in other respects mining is shown to be feasible at depths of 10,000 ft., and over, the difficulties presented by shaft sinking are likely to be overcome at the cost, naturally, of greater outlay."

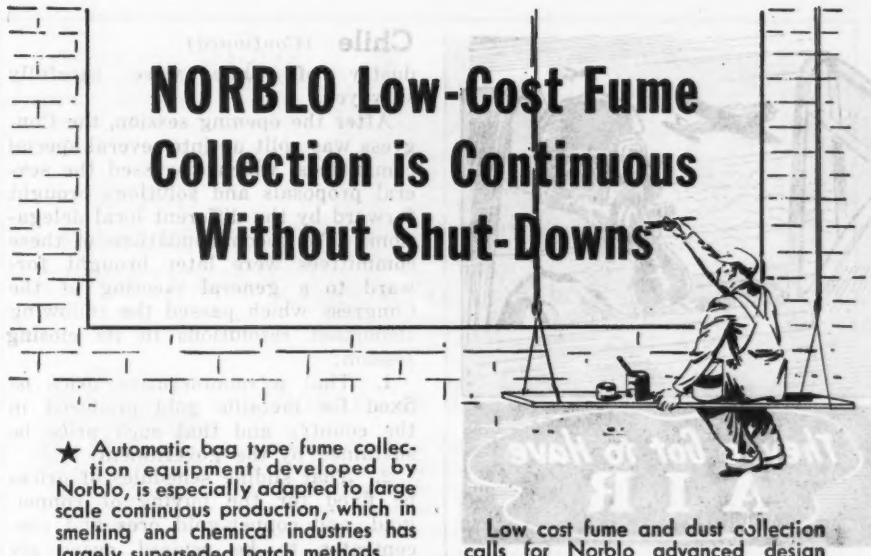
★Transvaal gold production in February amounted to 965,569 oz., valued (at 168s. an ounce) at £8,110,780, representing decreases on the returns of the longer working period of January of 63,815 oz., or £536,046. Witwatersrand production was 62,582 oz. (£525,689) lower at 942,880 oz., value £7,920,192, and the yield from other districts was 1,233 oz. (£10,357) lower at 22,689 oz., value £190,588.

## CHILE

### Mining Congress surveys industry problems and recommends solutions—Nitrate company modernizes recovery process

★The celebration of the fourth centenary of the city of La Serena, founded by Pedro de Valdivia, conqueror of Chili, was the occasion for the holding of a Mining Congress at the invitation of the local Association, April 22 to 24. This congress was attended by delegates of all sections affiliated with the National Mining Society of Chile, the Chilean Institute of Mining Engineers, the University of Mining Schools, the Mining Loan Bank of Chile (Capa de Crédito Minero), Bureau of Mines, and other organizations connected with the Chilean mining industry. It may truly be said that at this Congress, one of the most important held in the country in recent years, all problems relating to the mining in-


NORBLO Low-Cost Fume Collection is Continuous Without Shut-Downs



★ Automatic bag type fume collection equipment developed by Norblo, is especially adapted to large scale continuous production, which in smelting and chemical industries has largely superseded batch methods.

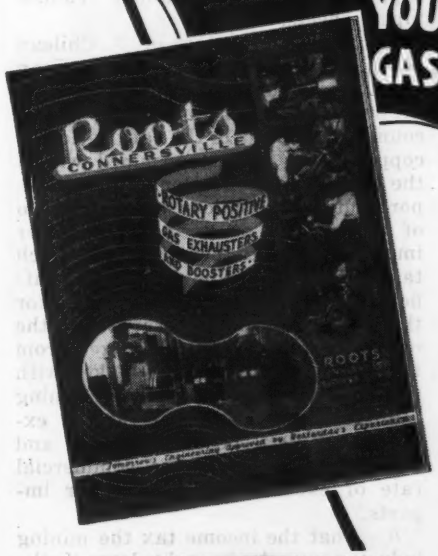
Many Norblo "bag houses" with cyclic bag cleaning are operating continuously, 24 hours a day for months, without shut-downs — and filtering capacity and efficiency are maintained at maximum.

Low cost fume and dust collection calls for Norblo advanced design which protects your investment against obsolescence, and for continued low maintenance. You save all four ways with Norblo engineered equipment and you get guaranteed performance. Write for descriptive folders.

Norblo

THE NORTHERN BLOWER COMPANY
6410 BARBERTON AVENUE CLEVELAND 2, OHIO

THIS BULLETIN CAN HELP YOU Select your GAS PUMPING EQUIPMENT




Bulletin 32-33-B-12 covers such vital subjects as the advantages of Positive Displacement principle, capacity and efficiency curves, features of design and construction, various applications and drives, dimension and capacity tables on standard units for moderate pressures. Your copy is ready for you. Also ask for Bulletin 31-B-15 covering complete line of smaller units for many applications.

ROOTS - CONNERSVILLE BLOWER CORPORATION
One of the Dresser Industries
505 Washington Ave., Connersville, Ind.

Roots CONNERSVILLE SINCE 1854
Rotary Positive GAS BOOSTERS

They've Got to Have AIR

Up in rarified atmosphere, sufficient oxygen is most vital to the crews of our planes. To insure an adequate supply, all planes are equipped with oxygen tanks so that at all times our flyers can have ample oxygen and thus be able to perform at greatest possible efficiency.

●

MINE-VENT *Tubing*

●

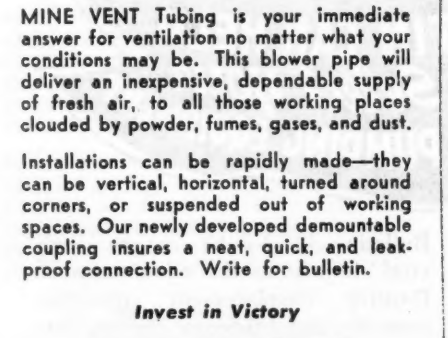
Improved ventilation is a highly important factor in maintaining working morale and efficiency.

MINE VENT Tubing is your immediate answer for ventilation no matter what your conditions may be. This blower pipe will deliver an inexpensive, dependable supply of fresh air, to all those working places clouded by powder, fumes, gases, and dust.

Installations can be rapidly made—they can be vertical, horizontal, turned around corners, or suspended out of working spaces. Our newly developed demountable coupling insures a neat, quick, and leak-proof connection. Write for bulletin.

*Invest in Victory*

**BUY WAR BONDS**



AMERICAN
BRATTICE CLOTH CORP.
WARSAW • INDIANA

## Chile *(Continued)*

dustry of Chile were carefully surveyed.

After the opening session, the Congress was split up into several special committees, which discussed the several proposals and solutions brought forward by the different local delegations. The recommendations of these committees were later brought forward to a general meeting of the Congress which passed the following important resolutions in its closing session:

1. That a remunerative price be fixed for metallic gold produced in the country and that such price be sustained by the government.
2. That sliding schedules of prices be fixed for the buying of copper, gold, and copper-gold ores and concentrates to be revised every six months, depending on the cost of production.
3. That the State should pay a bonus which will allow the industry to obtain a reasonable profit, or, in default, that a special rate of exchange be fixed for the mining industry which should enable this to obtain the same reasonable margin of profit as under the bonus system.
4. That the government should proceed, as soon as it is feasible, to secure the necessary machinery to carry out, through the proper organizations, the plan already worked out to industrialize the Chilean mining industry, such plan to consist in the construction of a copper smelter, an electrolytic refinery, and a modern industrial mill for the production of copper and copper alloys cables, pipes, sheets, etc.
5. To place a tax of 3 Chilean pesos per kilo, (about 4 American cents per pound) on electrolytic or fire-refined copper produced in the country and used in the fabrication of copper goods to be consumed within the country and the placing of an import duty of 3 Chilean pesos per kilo of electrolytic or fire-refined copper imported into the country. If such taxes and duties should prove insufficient to enable the State to pay for the help already proposed, the necessary funds should be taken from the profit the government makes with the dollars delivered by the mining companies at the official rate of exchange of 19.37 pesos per dollar and sold at 31, which is the commercial rate of exchange prevailing for imports.
6. That the income tax the mining industry pays be brought down to the level of those of agriculture, commerce, and the manufacturing industries and that the same be done with regard to social-security laws.
7. That the Executive should foster the bill placed before Congress by Senator Cruchaga Tocornal for coining silver.
8. That the surveying of mining claims may be carried out by independent mining engineers and certified surveyors, instead of exclusively by Bureau of Mines engineers and surveyors.
9. That the distribution of tires to the industry be carried out by a special committee where miners should be represented.
10. That these conclusions be carried out by means of laws.
11. That the Government should provide the Mining Loan Bank of Chile the necessary funds in order that this organization would be placed in a position to carry out satisfactorily the function for which it was created.

★Some of the conclusions approved unanimously by this Mining Congress may seem strange to American readers of *Engineering and Mining Journal* and may carry the wrong impression that Chilean miners have become thoroughly socialistic in their views and are not strong enough, or capable enough, to stand without the helping hand of the State. However, that would be quite a wrong impression. The Chilean miners have been in the past and are today individualistic and favor free enterprise as much as those anywhere else in the world. As previously explained in a former number of *Engineering and Mining Journal*, Chilean miners have been laboring since the war started under very difficult conditions imposed on them by inflation. Such conditions spring from the fact that cost of production has risen very considerably in Chile while prices of ores,

Recognized Universally as the ULTIMATE in Valves and Couplings

KNOX MANUFACTURING CO.
812 CHERRY ST., PHILA. 7, PA.
*Since 1911 Producers of*
KNOX
Valves - Couplings - Nipples - Clamps - Menders

concentrates, and metals have remained stationary or have declined 20 percent in the case of copper ores. Agriculture and the manufacturing industries, which dispose of their products and goods in the home markets, have passed their increased cost of production to the consumer, a procedure that cannot be followed by the miner, compelled as he is to sell his metals abroad.

★The Tarapacá & Antofagasta Nitrate Co., like all the enterprises employing the Shanks process in their "oficinas," or nitrate plants, had been producing for many years past under difficult economic conditions on account of increasing cost of production and a lower selling price for its nitrate. The board of directors decided wisely to adopt the most up-to-date methods available, both in the mining operations to obtain the "caliche," or nitrate ore, and in the elaboration of it to produce the best and highest-grade quality of the sale to compete both with the natural nitrate of other Chilean companies or with other classes of synthetic nitrogen fertilizers.

Plans were made some years ago to design and build the new Victoria plant, having a normal yearly capacity of 180,000 metric tons of sodium nitrate. Power is obtained from a deisel plant capable of generating 5,860 kw.

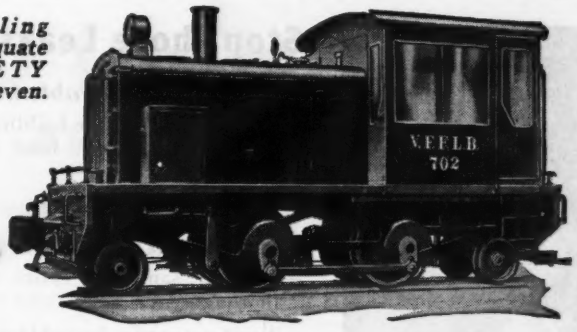
The caliche is mined by surface methods from five different opencasts or "rajos," as they are called in the Chilean pampa. The overburden is cleaned up by scrapers and the caliche is loaded into ore-cars by Bucyrus-Erie 100-D shovels having 3-cu. yd. dippers. Drilling is done by wagon drills mounting Ingersoll-Rand X-71 air drills. Ore is transported to the coarse-crushing plant by 36-ton General Electric locomotives pulling six 30-ton ore cars. There are 9 locomotives and 135 cars for this work.

The nitrate ore, in pieces having a maximum size of 30 in., is dumped into a 42-in. Traylor gyratory crusher, which reduces the ore to 7.5 inches. This is again crushed in four secondary 16-in. gyratory crushers, and the tertiary, or final, stage of crushing is done in four 4-ft. Symons cone crushers to ¾ in.

The leaching plant consists of 10 reinforced concrete leaching vats 73x68x16.5 ft. which hold about 3,000 short tons of nitrate ore. This is leached by hot solutions at between 45 and 50 deg. C. (113 to 122 deg. F.). The leaching solutions are heated by the refrigerating water used in the diesel power plant. For emergency purposes, a small standby boiler plant has been built. At temperatures of 113 to 122 deg. F., the solutions are capable of dissolving between 400 and 550 grams of sodium nitrate per liter. Once the dissolving solutions have attained this concentration, they are brought to the crystallizing plant, where they are cooled to 46.5 to 50


*Leading and trailing trucks permit adequate speeds with SAFETY where track is uneven.*

**TOUGH HAULAGE CONDITIONS ?**



DAVENPORT LOCOMOTIVES

**Choose a DAVENPORT**

Davenports are built to "take it." They have an over-plus of inbuilt stamina to suit them for hard work under difficult conditions. You may select the size and type of Davenport Locomotive suited to your haulage requirements with the satisfying knowledge that it will deliver EXTRA years of efficient, flexible and trouble-free performance. Our engineers will gladly analyze your haulage conditions and submit reliable recommendations—without obligation. Entrust your important post-war haulage to modern Better-Built Davenports.

EXPORT OFFICE **BROWN & SITES** 50 Church St., New York Cable Address 'Brosites'

DAVENPORT LOCOMOTIVE WORKS
A DIVISION OF DAVENPORT BESLER CORPORATION, DAVENPORT, IOWA
ESTABLISHED IN 1900

Tendremos mucho gusto en enviarle un catalogo en Espanol, describiendo las Locomotores Davenport.

**ATKINS**

**The Lighter-Weight, Easier-Handling CHAIN SAW**

For light, easy handling, the Atkins Chain Saw is unique in its field. For dependable operation under the toughest climatic conditions, it stands alone. That's because Atkins Chain Saw is electrically powered by a generator mounted on tractor, trailer, or truck. By means of cable, it can be run as far away from the generator as 1000 feet. As to cutting speed, the teeth on an endless chain fairly fly through wood, cutting 30" softwood logs in as little as 60 seconds. Full details on this efficient time and money saver are given in the Atkins Chain Saw bulletin. Write for it today.

Typical Atkins Chain Saw "package unit" with air-cooled gas engine and generator for use on tractor, truck or trailer.

**E. C. ATKINS AND COMPANY**
487 South Illinois Street, Indianapolis 9, Indiana
*Agents or Dealers in all Principal Cities the World Over*

## Stop Those Leaks With SIKA

***If This Is Your Problem:***

— to seal leaks, in mine buildings, shafts and other concrete structures, from the inside against pressure.

— to prevent future seepage.

***Here Is Your Solution:***

— hack or sandblast entire surface and clean thoroughly.

— divert water to enlarged bleeder holes by applying quick-setting mortar to smaller leaks. For trowelling use SIKA No. 4A; for guniting, use Gunite SIKA.

— plug bleeders with extremely fast-setting SIKA No. 2 mortar.

— apply a protective cement coat over entire surface to prevent future leakage. As a water-resisting compound, use SIKA No. 1 for trowel application, or Gunite SIKA for Gunite work.

Waiting for you — a copy of SIKA's condensed catalog, with quick, concise information on these SIKA compounds. Write for your copy today.

Sika

Reg. U. S. Pat. Off.

**SIKA CHEMICAL CORPORATION**

**47 Gregory Avenue** **Passaic, N. J.**

***Manufacturers of***

**Compounds for Concrete Problems • Plastiment, The Concrete Densifier**

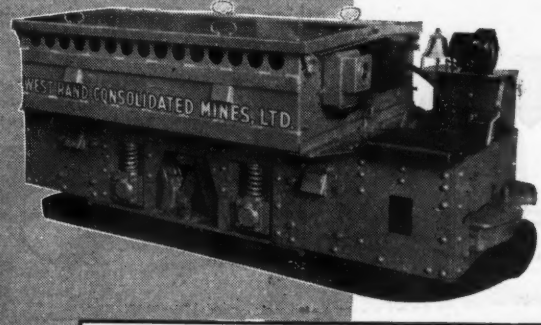


THE ATLAS TYPE "A"

## ..for Main Line Haulage

○ A main line locomotive designed to help maintain top production schedules! Rugged, heavy-duty construction plus the completely reliable ATLAS Double-Reduction Spur Gear Drive assures low-cost operation and a minimum of maintenance.

Complete, detailed information is available on request. Write!




Canadian Representative
Mine Equipment Company,
Kirkland Lake, Ont.
International Agencies &
Machinery Co., Ltd.,
Vancouver, B. C.

BMS Limited, Industrial Stand
223, Lower Germiston Rd.
Jupiter, Johannesburg,
So. Africa

**THE ATLAS CAR & MFG. CO.**
★ **CLEVELAND, OHIO, U.S.A.** ★


## Chile *(Continued)*

deg. F., which brings down between 100 and 200 grams of sodium nitrate per liter. Crystallization is accomplished by the Krystal process, invented by the Norwegian engineer Finn Jeremiassen. According to this process, it is possible to vary at will the size of the crystals. Such crystals do not agglomerate, giving a uniform product which is easily and uniformly spread out upon the soil.

★After prolonged discussions and failure to reach agreement between delegates of the workers and the management at the Potrerillos copper enterprise, the workers voted to strike. However, the government intervened in trying to prevent the strike and the workers' delegates were called to Santiago to continue the discussion with the management of Andes Copper Mining Co. in the capital under the supervision of the Labor Ministry. In order to arrive at the facts, the government ordered that a special economic and technical report should be made by the Mining Loan Bank of Chile to decide whether the company was in a position to pay higher wages. According to the version published in Santiago newspapers, the report showed that the company was in a difficult position owing to increasing cost of production and lower grade of ore, which had come down to 1 percent copper. Even then, no satisfactory arrangement could be arrived at, and on March 22 the workers decided to call what in Chile is known as a "legal strike," all provisions of the Labor Code having been fulfilled before the strike was called. Notwithstanding, public opinion held that though the strike could be called legal, it was not a just strike when copper was urgently needed to bring the war to a successful end. After the strike has been on for some days the government decided on compulsory arbitration. On April 9 the men, numbering 4,500, went back to work.

★According to custom, arrangements between employers and employees as to wages, hours of work, and other working conditions are settled for periods of one year. About a month before the yearly period is up, the syndicate representing labor at the particular mine or factory presents a petition to the management as to conditions the petitioners wish to be approved by both parties and under which the workers would be willing to work for another annual period. The Chilean Labor Code has wisely provided for a slow legal procedure which tends to prevent strikes. When all legal resources laid down by the Code fail, the Government can decide on arbitration provided both sides agree to accept and abide by arbitration. If this is not accepted by both sides, a vote is called and the strike accepted or rejected. Such has been the case recently with the Potrerillos and Chuquicamata copper mines, be-

longing to Anaconda Mining Co. In the latter the workers voted a strike recently, which was prevented from being declared by a last minute intervention of the Labor Ministry. An agreement was arrived at between labor and management to settle the dispute by arbitration. As it is usual in these cases, three arbiters are named: one representing labor, one capital, and the third an independent member nominated by the Ministry of Labor or the President of the Republic. According to the press, in both these cases, there will be just one arbiter, who will be named by the President.

## AUSTRALIA

**Development continues to fall off —Three Fiji mines consolidate their milling operations**

### WESTERN AUSTRALIA

★As is the custom of a number of English-owned mining companies, accounts for Boulder Perseverance, Ltd., are issued twelve months after the close of the financial year, and although such reports are far behind recent development, they give the latest general summary of operations available. Boulder Perseverance, Ltd., is one of the important mines on the Golden Mile of the Kalgoorlie gold field, and this company also directs the operations of the neighboring Kalgoorlie Enterprise Gold Mines, Ltd. In the year ended Dec. 31, 1943, the company's net profit shrunk to 50 percent of that of the previous year, due to the labor position and other wartime disabilities, by which tonnage of ore treated fell 24,909 tons, to two-thirds the normal output. Development increased slightly to a total of 2,262 ft. and was generally satisfactory. On the Australia East lode, at the 2,050-ft. level, a length of 214 ft. of ore was exposed, assaying 4.9 dwt. per ton over a width of 4 ft. At the same level a winze was sunk on the Bell lode to 73 ft. below rails in ore worth 12 dwt. per ton over 4 ft., the width of the opening.

Ore assaying 5 dwt. with an average width of 5 ft. was proved for a length of 88 ft. in the West Branch Lake View lode at the same level. Ore reserves were estimated at 414,700 tons of proved, broken, and probable ore having an average assay value of 5.44 dwt. gold per ton. The treatment plant (the company's ore is milled at the plant of Kalgurli Ore Treatment Co., Ltd., on the Perseverance company's lease, adjoining the main shaft) put through 82,052 tons of ore assaying 6.012 dwt. per ton. Treatment is by fine grinding, flotation, roasting the flotation concentrate, followed by the usual cyanidation-procedure, filtration on Oliver filters and Merrill-Crowe precipita-


# 1500 Units
## TO THE ARMY AND NAVY...

That is why we haven't been able to do very much for our friends in civilian clothes.

Carload after carload has gone out from GRUENDLER to all parts of the world.

Working for the Army and Navy has been a great experience—and a good one too. We have learned a lot of things that are going to make GRUENDLER CRUSHERS do a better job in a better way than ever before.

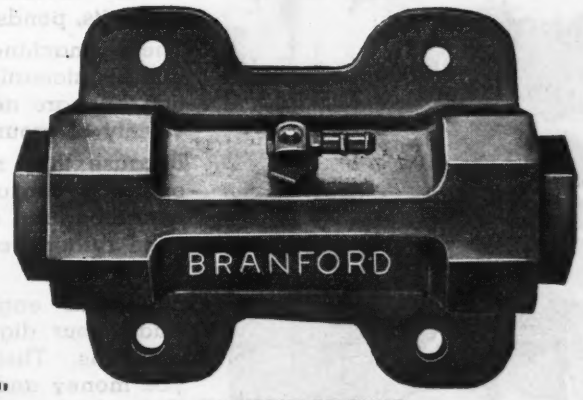
Some units have now been released and are in production. Write for data and delivery dates.—The unit you want may be available.

GRUENDLER ST. LOUIS, U.S.A.

# GRUENDLER
CRUSHER and PULVERIZER CO. • ST. LOUIS 6, MISSOURI

AIR OPERATOR
# VIBRATORS

SPEED
MATERIALS
IN
CARS
CHUTES
SKIPS
PIPES
HOPPERS
BINS




FROM 3/8" to 8" DIAMETER PISTON

'BRANFORD' FOURBOLT SIDE MOUNTING VIBRATOR
ONE OF VARIOUS TYPES

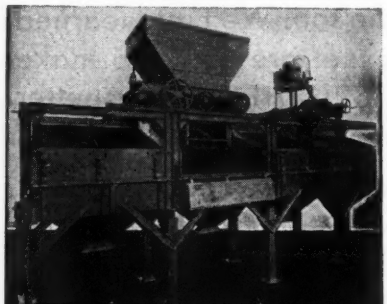
*Please State Problem . . . . . Write for Bulletin "E"*

**New Haven Vibrator Co., 150 Chestnut St., New Haven 7, Conn.**

**KEEP EQUIPMENT WORKING AT FULL CAPACITY .....**

# Taking the Smelter to the Ore

eliminates expensive transportation and treatment charges, resulting in savings up to 50%. Be sure it's a Mace, however. Mace Smelters are made in units to suit individual requirements and enable mine operators to profitably smelt their ores and concentrates.



Mill concentrates are roasted and agglomerated on the Mace Sintering Hearth for reduction in the furnace. The furnace and sinterer together meet all conditions—5 to 250 tons capacity.

Installations in: South & Central America, Mexico, Philippines, Burma, China, Europe, Canada, U. S. A.

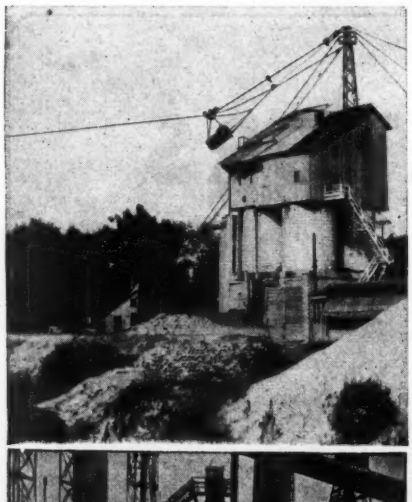
***Cable or write for literature.***

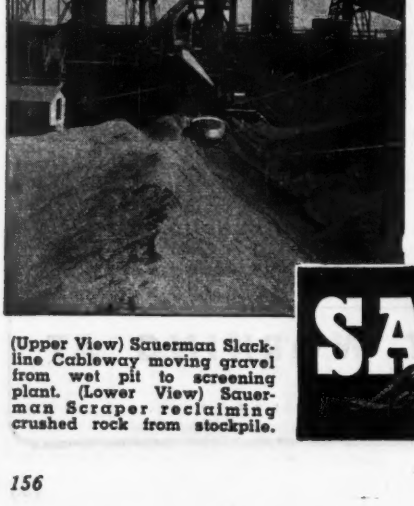
**The Mace Company**

FIRE CONCENTRATION METALLURGISTS

2763 Blake St., Denver, Colo., U. S. A.







(Upper View) Sauerman Slackline Cableway moving gravel from wet pit to screening plant. (Lower View) Sauerman Scraper reclaiming crushed rock from stockpile.

# SLASH COSTS
## *in moving materials*

**Ask any operator of a Sauerman Scraper or Cableway and he will tell you this is the cheapest way to handle materials at long range from pits, ponds or stockpiles.**

**These machines dig, haul and dump automatically in one operation and are adaptable to a great variety of ground conditions.**

**Because they need only a single operator, consume little power in operation, and are easy to keep in good running order, they cut costs to the bone.**

**Sauerman engineers will gladly study your digging or stockpiling problems. Their advice may save you money and will be given free. Write for our catalog and tell us about your problems.**

**SAUERMAN BROS., INC.**
***584 S. Clinton St., Chicago 7, Illinois***

**SAUERMAN**
*Long Range Machines*


## Australia *(Continued)*

tion. Recovery was 93.6 percent and the combined assay value of the flotation tailing and cyanide residue was 0.41 dwt. per long ton. Costs per long ton in Australian currency were: Ore production, 19s. 9d; development and diamond drilling, 4s. 2d.; treatment, 14s. 7d.; other expenses, 2s. 8d.; total, 41s. 2d.

★The Kalgoorlie Enterprise Mines work a different series of lodes lying to the northwest of the Boulder Perseverance group of ore bodies. Ore is hauled through the Victoria shaft and transported by diesel lorries to the treatment plant of the Kalgurli Ore Treatment Co. Connection has been made with the Boulder Perseverance mine at the 2,000-ft. horizon by a long drive which passes through a corner of the South Kalgurli Consolidated, Ltd., Co.'s leases. Mine development decreased in comparison with the previous year in accordance with the scarcity of labor, the total completed being 1,390 ft. together with 874 ft. of diamond drilling. The principal development was a length of 150 ft. of ore disclosed by driving on the Greenhill shoot at No. 19 level; the average width was 8.5 ft. and the value 4.7 dwt. per ton. Ore reserves were reported as 359,100 tons of broken, proved, and probable ore with an average value of 6.31 dwt. gold per ton. Production amounted to 53,753 tons of ore assaying 6.333 dwt. per ton. Recovery was 93.6 percent. Operating costs in Australian currency were: Ore production, 18s. 2d.; development and diamond drilling, 4s. 0d.; ore transport, 9d.; treatment, 14s. 7d.; other expenses, 2s. 7d.; total costs per long ton, 40s. 1d.

★Situated to the north of the Boulder Perseverance and Enterprise mines is the property of North Kalgurli (1912), Ltd., which holds leases approximating 150 acres. The company's operations during the year which ended on Dec. 31, 1943, were adversely affected by the prevailing conditions, and the quantity of ore treated decreased from 108,665 long tons to 79,159 tons, which latter figure is only 40 percent of normal output. The grade of ore treated was 6.948 dwt. per ton, whereas that in the previous year was 7.494 dwt. per ton. Gold value of the ore treated was 0.56 dwt. per ton higher than the average grade of the positive ore reserves. As a result of the reduced amount of development possible, there was a decrease in the tonnage of ore reserves. These were estimated at: Positive ore, 975,537 tons; 6.38 dwt. per ton; probable ore, 395,270 tons; 5.55 dwt. per long ton. Costs in sterling, for the year were: Mining, 12s. 6d.; treatment, 12s. 9d.; total, per long ton, 31s. 10d. Development work decreased from 5,324 ft. to 2,266 ft. and diamond drilling completed was 4,299 ft. compared with 6,017 ft. in the previous year. Pay-

able values were located in all parts of the mines in which exploratory work was carried out. The North Kalgurli company is the third of the group of mines the ore from which is treated at the plant of the Kalgurli Ore Treatment Co., a joint arrangement which has proved satisfactory. The company also owns the Croesus Proprietary leases to the north of its own property, and on which it has erected the newest mill on the field. This plant had just been brought into operation when war conditions compelled its closing for the duration.

## FIJI

★Relaxation of wartime regulations has permitted the publication of operating results by the two large Fijian gold mines, Emperor Mines, Ldt., and Loloma (Fiji) Gold Mines, N. L. The operating company of Emperor Mines, Ltd., is Emperor Gold Mining Co., Ltd., the shares of which are held by the former company. Ore breaking has in the past been confined mainly to the mining of oxidized ore by open-cut methods, and meantime the mine has been prepared for stoping of sulphide ore to No. 7 level, or approximately 640 ft. below surface, or some 200 ft. below the bottom of the open cut. The main, or Wallace Smith shaft is now being sunk to a depth of 50 ft. below the No. 10 level and has reached a point 884 ft. from surface. On reaching the full depth, levels will be opened out at the Nos. 8, 9, and 10 horizons, and a pumping station established at the last named level.

Although the labor position was difficult it was possible to carry out an increased amount of development, the total being 4,232 ft., compared with the previous 1,456 ft. Results were generally encouraging, although the initial work at No. 7 level was disappointing. Exploration of the eastern section of No. 3 level disclosed several flat makes of ore showing telluride. On No. 6 level the south drive on the Loloma lode was carried 353 ft., the average assay value being 9.4 dwt. gold per ton over a width of 37 in. Development on No. 7 level disclosed a rich flat lode, of strong character, 42 in. wide, and subsequent diamond drilling has shown considerable lateral extension. The country rock is basalt, and crosscutting has shown the following values per ton in the lode: 27 to 30 ft., 2 dwt.; 30 to 42 ft., 4 dwt.; 42 to 72 ft., 5.2 dwt.; 72 to 75 ft., 35 dwt.

Flat lodes are a characteristic feature of the Vatukoula gold field and it is the company's intention to carry out an extensive churn-drilling campaign in conjunction with underground diamond drilling. Ore reserves are estimated at: positive ore, oxidized, 4,000 tons; 5.6 dwt.; sulphide, 800,000 tons; 7.8 dwt. Probable ore: sulphide, 100,000 tons; 7.8 dwt. per ton. Total ore reserves, 804,000 tons. This figure is only 16,000 tons less than in the previous year and the position was assisted through the treatment of a large tonnage of marginal ore which under normal circumstances would probably have been unprofitable. During the year a total of 157,954 tons of oxidized and semi-oxidized ore was treated, the average grade being 3.96 dwt. per ton, yielding 25,029 oz. of gold. A large portion of this ore was obtained outside the estimated reserves. In addition to this tonnage broken, 133,330 tons of overburden was removed in the open-cut operations. Operating costs in Fijian currency per ton of ore milled, were: Mining, 5s. 8.22d.; milling, 12s. 9.43d.; general expenses, 3s. 0.33d.; total, 21s. 5.98d.

In the previous year mining cost 7s. 2.45d., milling 18s. 6.66d., and general expenses 3s. 6.78d., making a total of 29s. 3.89d. per ton. No provision has been made for development, as sufficient credit was carried forward from earlier periods. Following the decision to mill the Emperor ore and that from the Loloma mine and the Fiji Mines Development, Ltd., at a combined mill, the Emperor mill was modified and enlarged to a capacity of 13,000 tons per four-weekly period, of which Emperor will supply 10/13, Loloma 2/13, and Fiji Mines Development 1/13. The combined plant is now in operation. Treatment consists of pre-cyanidation, flotation, roasting, and cyaniding of concentrates.


**AVOID CONFUSION**

**And have us make an engineering and metallurgical survey of your plant, prepare for better efficiencies.**

**BE COMPOSED**

**Have definite plans to meet the problems of design and operation, of the present and for the future.**

**WRITE**

**For our plans, made especially for you.**

BOOTH ENGINEERS
F. C. TORKELSON CO. **ASSOCIATED ENGINEERS**
METALLURGICAL AND DESIGNING ENGINEERS
FIFTH FLOOR PACIFIC NATIONAL LIFE BLDG. SALT LAKE CITY 1, UTAH

Phibro *Philipp Brothers, Inc.*
*70 Pine Street, New York 5, N. Y.*

**METALS — ORES — CHEMICALS**

FERRO-ALLOYS • METALLIC BY-PRODUCTS • SCRAP
IMPORT • EXPORT

THIRTY YEARS SERVICE TO THE MINING INDUSTRY IN THE MARKETING OF ORES AND THE SUPPLY OF MINING EQUIPMENT AND SUNDRIES

DIFFERENTIAL AIR DUMP CARS • TWO WAY AUTOMATIC DUMPING • ECONOMICAL FOR ORE AND WASTE ROCK

DIFFERENTIAL STEEL CAR COMPANY
AIR DUMP CARS • MINE CARS • LOCOMOTIVES • ROCK LARRIES
BURDEN BEARING LOCOMOTIVES • COMPLETE HAULAGE SYSTEMS
FINDLAY, OHIO

# EQUIPMENT NEWS

## Continuous Centrifuge

Designed for dewatering any nonabrasive material by the action of centrifugal force, a continuous centrifuge has been developed by Denver Equipment Co., Denver 17, Colo. Where applicable, the centrifuge is said to have advantages over conventional filtering methods. The machine consists of a revolving perforated basket or drum, within which is a rotating basket scraper. Both rotate in the same direction, with a small differential in speeds, and are inclosed in a housing. Feed entering

the hopper is picked up by a screw conveyor which drops the material on the rotating basket. The filtrate passes through the screen, and the solids are conveyed to the discharge end by the slower rotating scrapers. In some cases a thin layer of solids may remain on the screen, forming a filter medium. The thickness of this layer is determined by the adjustable clearance of 1/32 to 1/16 of an inch between screen and scrapers.

## Asbestos Pump Packing

Using asbestos yarn instead of cotton, Greene, Tweed & Co., New York 66, N. Y., has developed a new packing plaited in square form, suitable especially for centrifugal pump shafts, reciprocating pump rods and plungers, and other parts subjected to the effects of hot as well as cold water. The asbestos fibers are impregnated with palmetto graphite grease, which protects the packing from water-logging and disintegration.

## Improved Blasting Cap

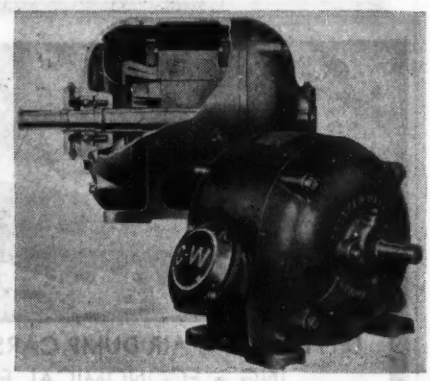
Electric blasting caps now produced by E. I. du Pont de Nemours & Co., Wilmington, Del., have two improvements—nylon-insulated wires and rubber plug closures. The nylon covering is said to be the equal of enamel insulation in preventing current leakage, and is unaffected by extreme or rapid changes in temperature. Brilliant colors minimize the possibility of errors in connections. The rubber plug closures, double crimped in the shell, replace the combination of bridge plug, asphaltic waterproofing, and sulphur seal, increasing resistance to water penetration. Much shorter than the old type, the new shells make priming easier and safer without sacrificing explosive strength.

## Compact Circuit Breaker

A new 100-amp. De-ion circuit breaker which requires less space and permits lighter structures for distribution panelboards and built-in applications is announced by Westinghouse Electric & Manufacturing Co., Pittsburgh 30, Pa. All ratings are available in one compact breaker with uniform pole spacings and terminal arrangement, providing complete interchangeability between ratings. A new frame permits for the first time the use of a 100-amp., 600-volt a.c. or 250-volt d.c. breaker in the same space required by the 50-amp., 600-volt a.c. or 250-volt d.c. rating. Thermal and instantaneous magnetic trip elements permit maximum loading of circuits and fast resumption of interrupted service. Silver-alloy contacts give increased contact life with lower wattage loss.

## Protected-Type Motor

Combining the surplus capacity of the conventional motor with protection against dripping liquids and falling objects, a new motor has been developed by the Crocker-Wheeler Division of Joshua Hendy Iron Works at Ampere, N.J. There are no openings in the frame or shields above the horizontal center line. Centrifugal seals permit the use of softer grease for better lubrication and longer



bearing life. In the rotor construction, bars, fans, and end rings are cast in one operation from aluminum alloys. Coils are protected by vinyl acetate insulation.

## INDUSTRIAL NOTES

**Vanadium Corporation of America**, New York 17, N. Y., is resuming publication of the *Vancoram Review*, which will be issued quarterly for the information of those interested in the development and application of ferroalloys and metals.

**Roy Wicker**, formerly with Western Machinery Co., is now associated with the **Florence Machinery & Supply Co.**, Denver 2, Colo.

**F. S. Cockburn** has been reappointed field representative in Peru for the **Allis-Chalmers Mfg. Co.**, and will be located at Casilla 2233, Lima, Peru.

**Gould Storage Battery Corporation**, Depew, N. Y., announces that **Pressed Steel Car Co., Inc.**, Pittsburgh, Pa., will act as exclusive agents for the export of Gould industrial storage batteries to all parts of the world except Canada.

**Electric Storage Battery Co.**, Philadelphia 32, Pa., announces the appointment of **J. A. Cronk** as manager of the company's Atlanta branch, succeeding **Mark C. Pope, Jr.**

**R. P. Tyler** has been appointed general sales manager for **Macwhyte Co.**, wire-rope manufacturers, Kenosha, Wis.

## BULLETINS

**Silicone Varnishes.** Dow Corning Corporation, Midland, Mich., has published a bulletin illustrating and describing "993" high-temperature silicone electrical insulating varnish.

**Rotary Blowers.** Bull. No. P100 explains the principles of operation, design, and construction of Pottstown rotary positive displacement type blowers, issued by Pottstown Blower Co., division of Allen Billmyre Co., Mamaroneck, N. Y.

**Centrifugal Pumps.** Bull. B6351 of Allis-Chalmers Mfg. Co., Milwaukee, Wis., gives standard specifications of pedestal-type centrifugal pumps.

**Welding Alloys.** Eutectic Welding Alloys Co., New York 13, N. Y., has published a bulletin on low-temperature alloys, with a selector chart.

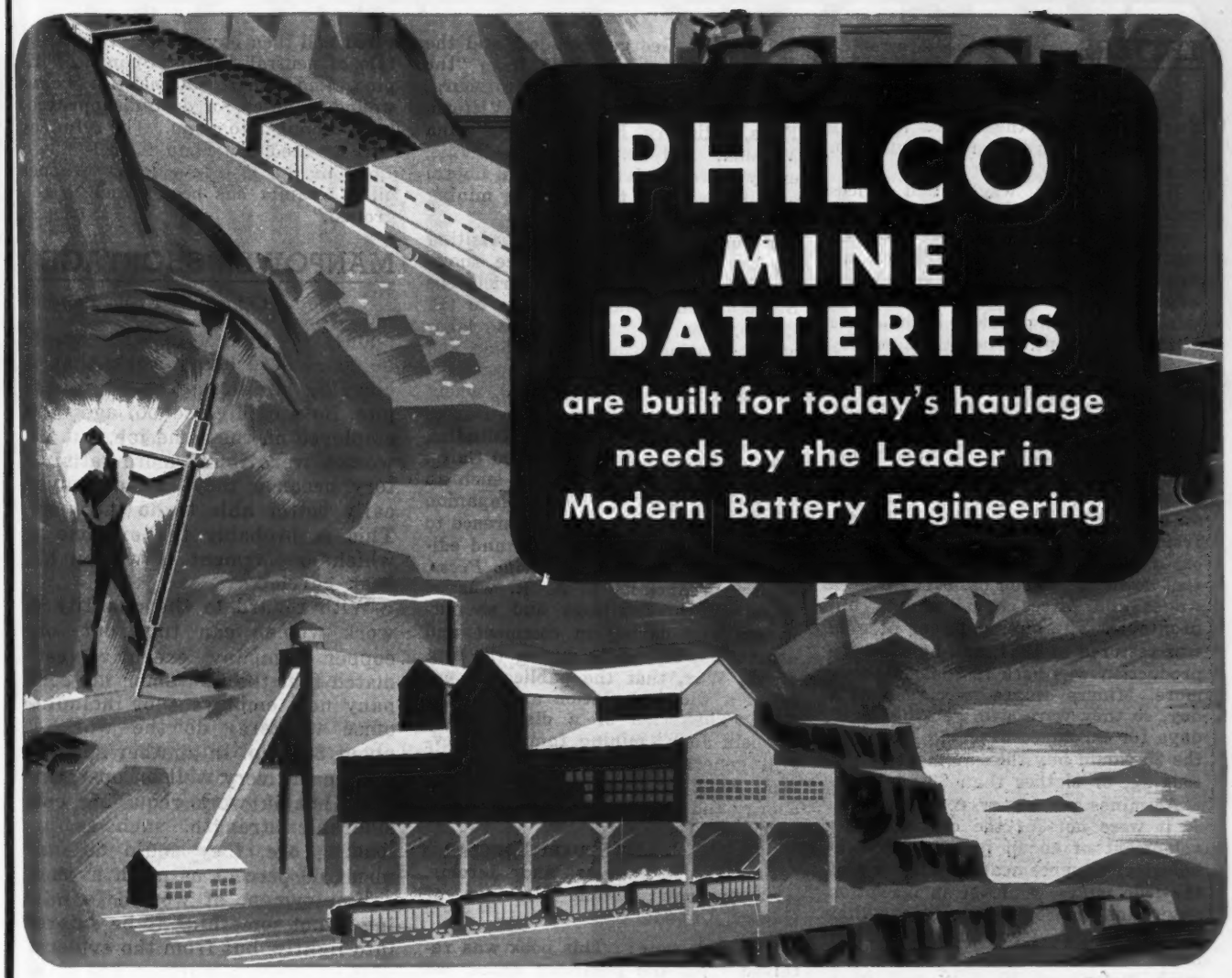
**Wire Rope Clips.** An illustrated pamphlet gives directions for using Crosby wire rope clips made by American Hoist & Derrick Co., St. Paul, Minn.

**Welding Electrodes.** Allis-Chalmers Mfg. Co., Milwaukee, Wis., has published an 8-page bulletin containing a comparison chart showing the application of different types of welding electrodes.

**Cable Vulcanizer Kit.** Mines Equipment Co., St. Louis 10, Mo., has published bulletin RV-104K, showing a number of kit-box assemblies for vulcanizing cables.

**Rotameters.** Bull. R-100A of Cochrane Corporation, Philadelphia 32, Pa., contains specifications for the selection of visible indicating type of flow-measuring instruments.

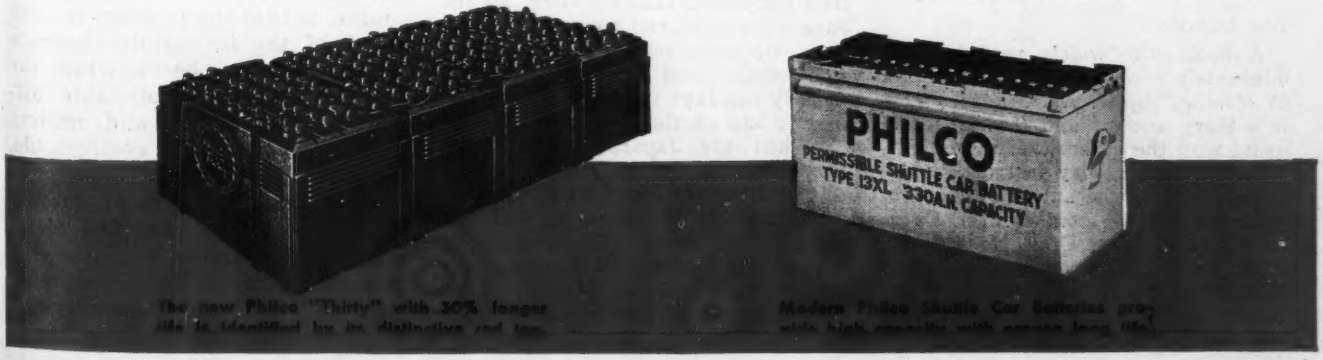
**Tractor Equipment.** Bucyrus-Erie, South Milwaukee, Wis., has issued an illustrated booklet showing the application of dozers, scrapers, and other tractor equipment in action in war and peace.




## NOW—ANOTHER PHILCO "FIRST"

Newest of the long series of major storage battery developments pioneered by Philco, is the revolutionary new Philco "Thirty," that gives 30% longer life. Here is the battery for your toughest mine haulage jobs—now and after the war. It gives you the capacity to haul maximum tonnage day after day, with your locomotives and shuttle cars. And because of its 30% longer life, with lower depreciation and maintenance costs, Philco "Thirty" will save you money. Increasing quantities are now available for current deliveries. Write for information. PHILCO CORPORATION, *Storage Battery Division,* Trenton 7, New Jersey.

**For 50 years a Leader in Mine Storage Battery Development**




The new Philco "Thirty" with 30% longer life is identified by its distinctive end top.

Modern Philco Shuttle Car Batteries provide high capacity with maximum long life.

## LETTERS

*Continued From Page* 116

England to enter the market and buy or sell gold when the price went down or up.

High wartime wages and prices cause a loss of buying power to all fixed incomes from invested capital, insurance, and to thousands of endowed institutions. Unless prices and wages return to normal after a war, this loss of buying power is the cause of unemployment. When the currency is depreciated by increasing the price of gold, the buying power of gold is restored, but not that of the dollar or fixed incomes.

Before the first World War, in the gold mines of California, miners' wages were $3 a day (seven days for an ounce of gold) and the production from lode mines was about 800,000 oz. a year. In 1929 this production was down to 150,000 oz. because high wages and prices made mining unprofitable. The buying power of gold was restored in 1934, and by 1936 the production was back to 800,000 oz. or more. Miners' wages were then $5 a day, so they were still working seven days for an ounce of gold. However, the $5 would buy then no more board, lodging, or clothes than $3 in 1914.

As mines get deeper, costs increase. If it were not for the continued development of cheap power and technological advancement, few if any of the lode mines would be in operation now, thus disproving the theory that labor-saving devices cause unemployment. If the miners work 48 hours a week instead of 40, they will have more money with which to buy luxuries. The extra production of six miners for one day a week will give steady employment to one man. A reduced work week is a cause of unemployment, not a remedy.

The thirty million dollars' worth of gold produced per year paid the wages of many more people besides the gold miners. The production of one pays the wages of others. It is the actual goods and services produced that determine the wealth and buying power of a nation, and not the wages paid in dollars. Producing wealth, not dollars, increases prosperity.

ARTHUR B. FOOTE

### "The Romance of Mining"

*The Editor:*

A book quite widely read but not adequately reviewed is "The Romance of Mining," by T. A. Rickard. This is a story ancient and modern, as is usual with the author, very well done, interesting, and very instructive.

Reference to the author's long professional record from Denver Camp Bird and Cripple Creek to London, New York, San Francisco, and now Victoria is hardly necessary, but the writer of this note may be excused for reference to personal contact.

T. A. R., George Kingdon, and the writer journeyed in 1925 from "the Cape" to Kimberley, Johannesburg, Rhodesia, Rhodes' tomb, Victoria Falls, Salisbury, Broken Hill, B'wana M'Kuba, and on to Elisabethville, everywhere receiving the usual liberal hospitality from those of the mining profession.

From Elisabethville, after visiting all the extraordinary surface showings of that marvelous district, the Belgian Congo, our trail was to the Congo, then down through the lakes of the floating islands to Cabala and thence to Leopoldville—across the lake to Kinpoko (or Kinshasa), where Stanley found Livingstone, to Dar es Salaam, to Zanzibar and to Kilindini, Aden, Djiboute, Port Said, and Cairo.

After such a journey with such an instructive and charming companion one may be pardoned for reference to it. As the successful owner and editor of the *Mining & Scientific Press*, of San Francisco, T. A. R. was so unique in his writings and so outspoken and daring in comment and expression, especially during the first World War, that the publication enjoyed a wide circulation and reputation. The scion of a distinguished "Cousin Jack" mining family of several generations, he has maintained their reputation by his indefatigable energy and the application of his God-given ability.

JAMES STUART DOUGLAS
formerly of Douglas and Jerome, Arizona, now of the Province of Quebec, Canada

[Editor's note: This book was received from the publisher about the same time as this letter, and is reviewed in this issue.]

## THE RAPE OF MANILA

*Continued From Page* 118

hunger and watching your friends die. Many of our people died of malnutrition and beri-beri; many others were in the earlier stages of beri-beri, swollen ankles, swollen faces, and swollen abdomens, hardly able to walk. Others were just living cadavers. People were dying at the rate of six and seven a day towards the end. The doctors estimated that within another three months 65 percent of the camp would have been in a critical condition. Six ounces of food daily—693 calories—were all the Japs allowed us, and most of that was rice. On occasions, the neutrals outside would send us food, but frequently the Japs turned it away, saying we had all the food we could eat.

"When the Japanese found that they were losing, they turned 'mad dog' and the stories of what has happened outside the camp in the last three weeks make the outrages in Poland and the rape of Nanking pale before the horrors of Manila. They burned homes of innocent people, for no reason at all. People were tortured and then bayoneted. Tale after tale of neutral friends, Spanish, Filipino, and other nationalities being wounded, killed, or just disappeared, keep coming into camp. The refugees have swelled our camp from 3,700 to 7,500 in the last few days. Almost all of Manila has been razed to the ground."

## MANPOWER SHORTAGE

*Continued From Page* 93

about 150 women in what would be considered heavy work, that of cleaning up bottom rock in the pits. Boys of high-school age were employed on the same job, but the women were found more satisfactory because they seemed physically better able to do the work. This is probably the extreme to which employment of women has been carried.

With regard to the quantity of work women can turn out, one copper company executive estimated that the 92 women his company now employs (not including office workers) do the work of about 80 men. In another smelter, women did very well on operating jobs, but in work requiring considerable strength, such as unloading ore, they could do only about 60 percent as much as men.

Employment of women in mining is not something to be entered into lightly, but from the evidence sent us, women workers are satisfactory in most cases. Probably the first woman hired by a mining company beginning to employ women in operating jobs should be a capable female administrative assistant who could advise both employer and women employees on how best to get along.

### Absenteeism

Absenteeism is one evil with which few mining companies have coped successfully. One executive had this to say, "Much time has been spent in studying the absentee problem, but no solution has been found." The difficulty, of course, is that the problem is composed of the intangible elements of human nature beside which the troublesome but predictable difficulties of mining and milling methods seem almost comfortable.

A few replies to our inquiry indicated some measure of success with absenteeism, and the methods used are shown in an accompanying table. A fuller explanation of New Park's bonus system is given elsewhere in these pages.